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PC WORLD

AUGUST 1992

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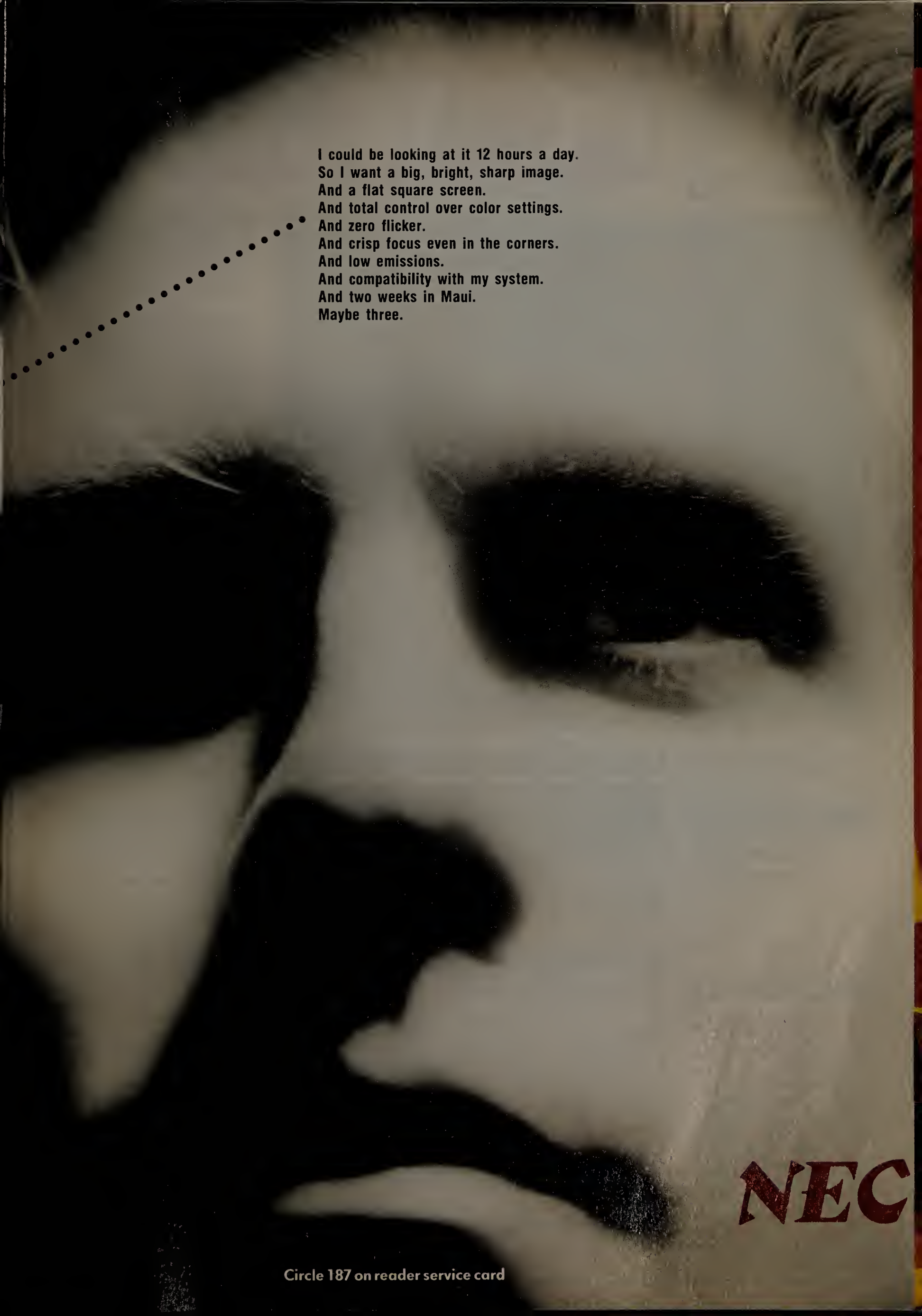
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AUGUST 1992
VOLUME 10
NUMBER 8

PC WORLD

Invest in the future: Enjoy entry-level 486 computing and an upgrade path to doubled performance with today's low-cost 20-MHz 486SX PCs.

COVER STORY

486SX PCs: Double-Time Performers

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Cover photograph by Robert Cardin

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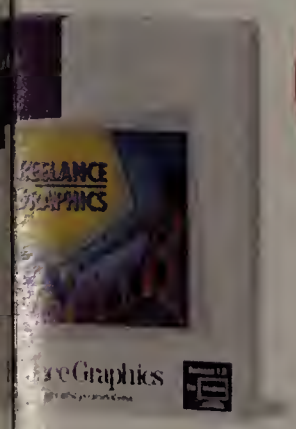

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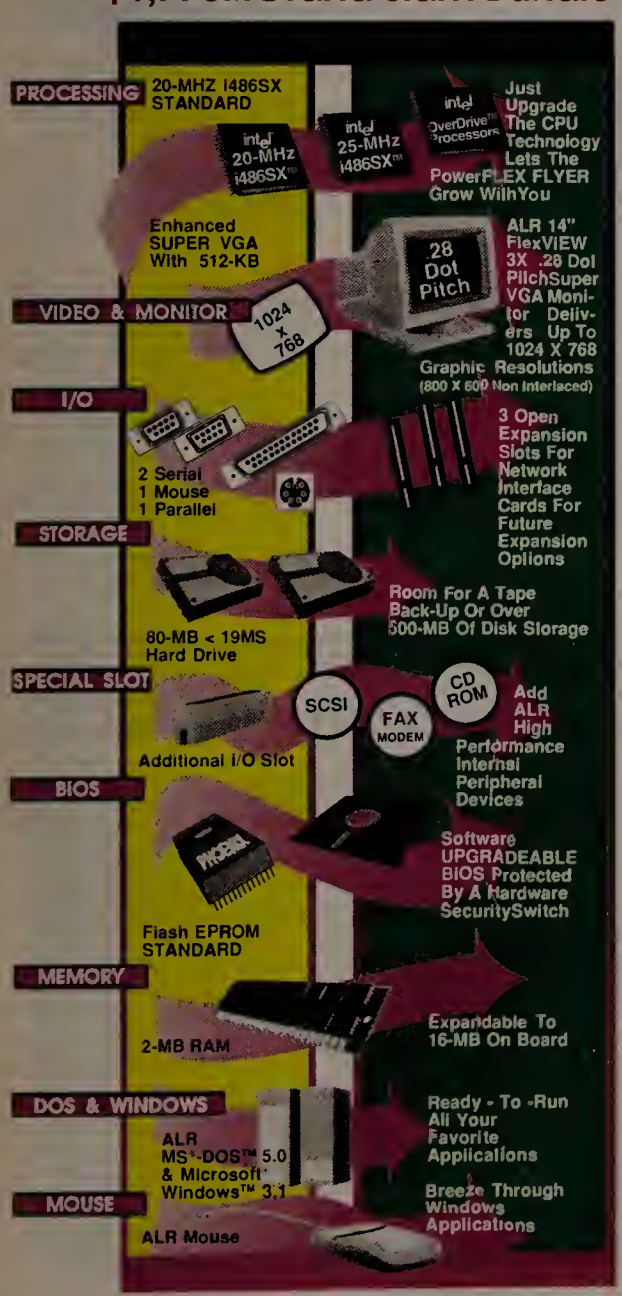

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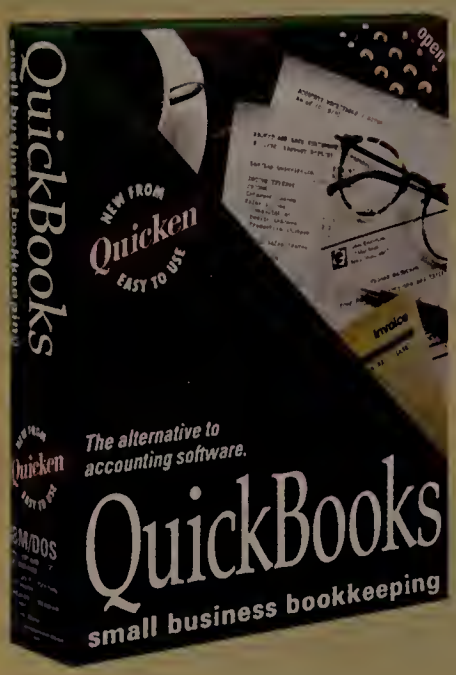

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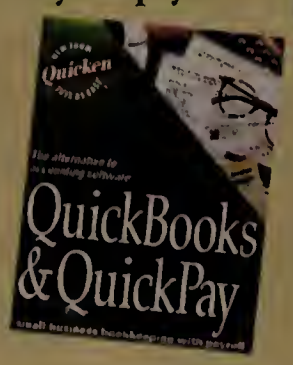

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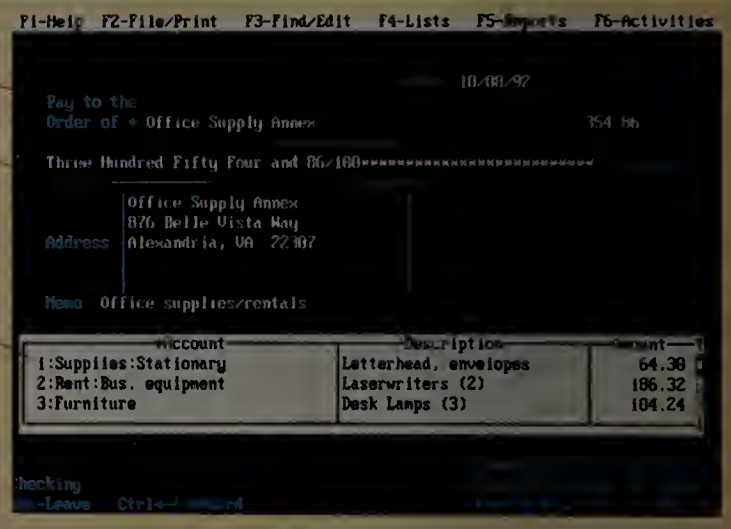
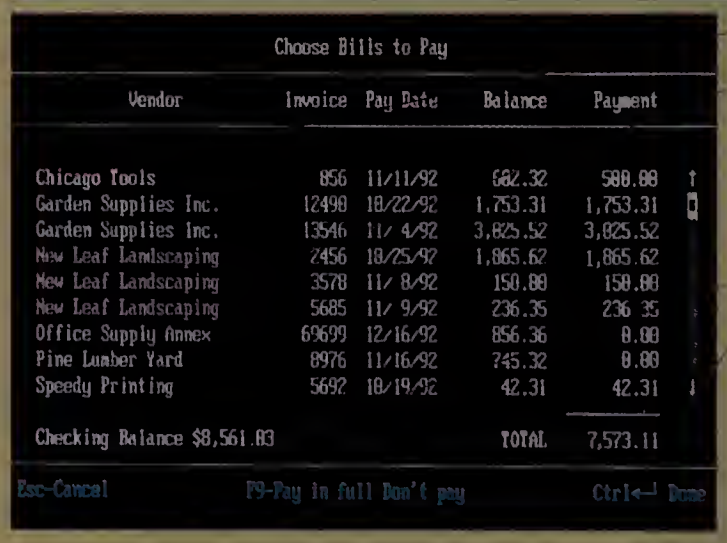
Flexibly assign expenses.

"QuickBooks, from Intuit, is the easiest of the accounting programs so far."
– The New York Times

"This is a great program if you're more interested in running your small business than becoming an accountant."
– PC World



Choose whom to pay and when.



Select the bills to pay from this list.

Payments to the same vendor can be combined.

Prints checks automatically for all bills selected.

Shows your bank balance.

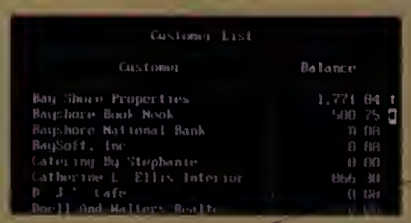
Totals how much you owe.

"Paying invoices is elegantly easy with QuickBooks."
– PC Magazine/Price Waterhouse Report

Invoice customers in minutes.

Practically no typing.

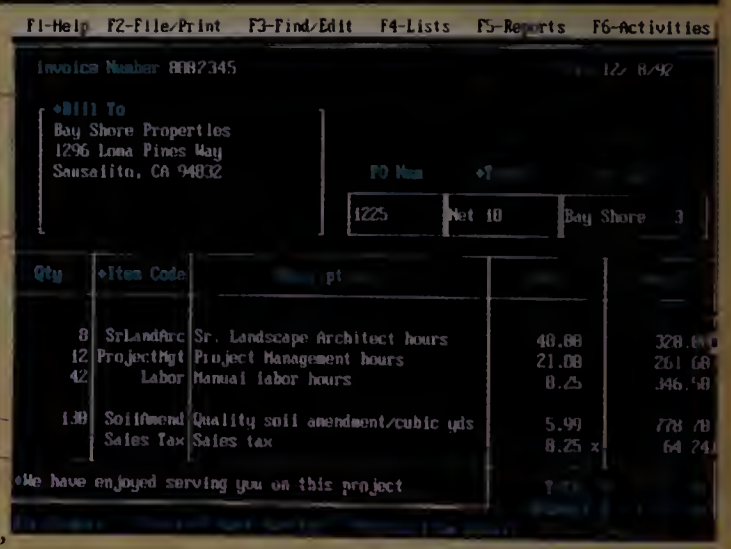
Pick here:



It's entered here.

Sales tax is calculated for you.

The math is done for you.



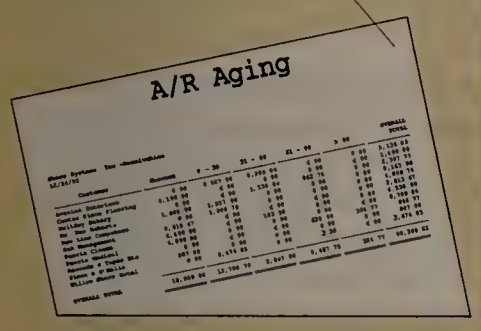
"QuickBooks' invoicing is as strong and flexible as any product tested for this review."
– PC Magazine/Price Waterhouse Report

Powerful bookkeeping, easier than you ever imagined possible.

Collect money faster than ever.

All the information you need to call customers.

Quickly see who's behind.



Collections Report

As of 12/31/92

Green Systems, Inc.

Customer	Invoice	Issued	Due	Balance Due
New Line Computers Mr. Ridge Evers (309) 676-9896 ext 124	1825	9/ 2/92	10/17/92	1,808.76
Total New Line Computers				1,808.76
Oak Management Mr. John Driscoll (309) 673-7897 ext 234	1886	10/ 5/92	12/ 4/92	810.92
	2081	10/12/92	11/26/92	57.75
Total Oak Management				868.67
Peoria Cinema Mr. Garry Pasweltz (309) 673-9856 ext	1841	9/17/92	11/16/92	6,435.00

Green Systems, Inc.-Receivables

Esc-Create Ctrl-M Memorize F1-Help Ctrl-P Print

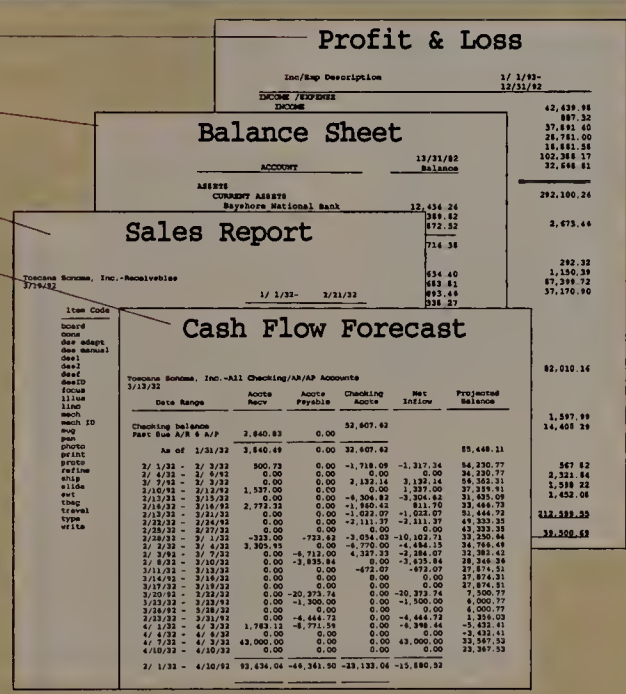
Complete financial picture of your business.

Get control over your bottom line.

Evaluate your financial resources.

See emerging sales trends.

Predict your cash needs.



Complete Financial Reports

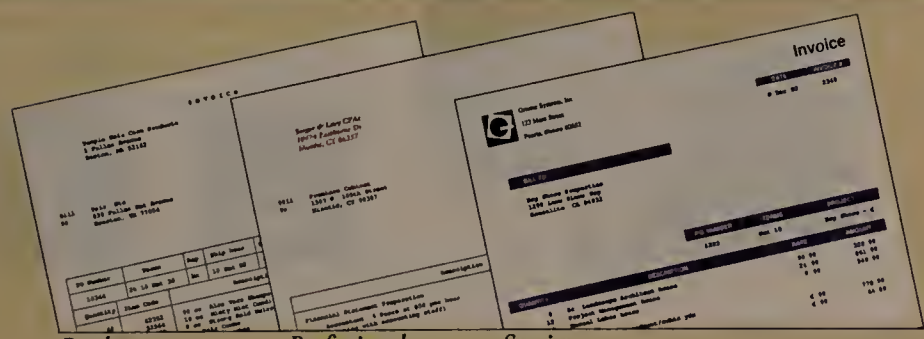
- Profit and loss statement
- Sales report
- Accounts receivable aging
- Collections report
- Accounts payable aging
- Sales tax report
- 1099 report
- Cash flow forecast
- Payroll report
- Budget report
- Other reports
  - Summary report
  - Transaction report
  - Itemized income and expenses
  - Project or Job report

"Reporting - an Intuit trademark - is superb in QuickBooks."
– PC Magazine/Price Waterhouse Report

Flexible invoice printing – 3 invoice formats.

Printing options:
- Your letterhead
- Plain paper
- Pre-printed form

Invoice formats:
- Product
- Professional
- Service



Product *Professional* *Service*

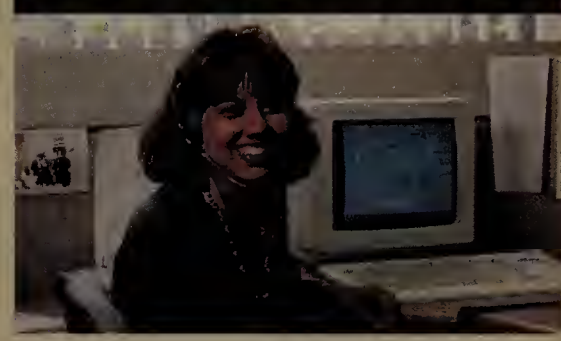
Tests prove QuickBooks is faster and easier.

An independent research group tested new QuickBooks against the two leading accounting software products. They gave small business bookkeepers four hours to complete a list of common bookkeeping tasks.

Compared with DacEasy,® twelve times more QuickBooks testers completed all tasks. And not one single Pacioli 2000™ tester could complete all the tasks.

(Complete research results are available on request.)
Source: Merrill Research, 1992

Unlimited FREE Support



"Intuit has a reputation for superior technical support."– The New York Times

Order now and you'll get two FREE bonus gifts!

Order QuickBooks now for $139.95 or QuickBooks & QuickPay for $179.95, and you'll also receive DoubleDisk™ and ViruSafe™ for FREE (a $229.90 combined retail value). Don't waste money on another expensive hard drive–get twice the disk storage space with DoubleDisk. Protect your computer with ViruSafe, the most complete virus safety system.

To order, call toll-free

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24 hours a day, 7 days a week

Full 60 day money back guarantee. Offers expire 9/30/92.

SPECIFICATIONS: PC compatible computer with 640K RAM and DOS 2.1 or higher. Hard disk with 2MB free. QuickPay not available for Canadian users. QuickBooks is a trademark of Intuit, Inc. DacEasy is a registered trademark of DacEasy, Inc. Pacioli 2000 is a trademark of M-USA Business Systems. DoubleDisk is a trademark of Vertisoft Systems, Inc. ViruSafe is a trademark of XTREE Company.

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Ad Code: PW8TB

Free While Quantities Last

Which data compression product?

Software Digest

RATINGS REPORT®

The Independent Comparative Ratings Report for Selecting IBM PC Business Software

Authorized Test Report

Volume 8, Number 16

ON THE FLY COMPRESSION PROGRAMS

On the fly compression programs compress and decompress data being transferred to and from storage. This provides twice as much effective space on any given storage device.

- The overview explains the operation of these programs and focuses on data loss or data corruption. NSTL highlights inherent problems with these programs as well as glitches and bugs uncovered during testing.
- Performance testing measures compression ratios achieved on a wide variety of data files. Executables, spreadsheets, text, graphics, fonts, archives, database, and Postscript files test each program for compression ratio and speed. All performance tests run on 386SX 16MHz and 486 33MHz machines. NSTL measures the amount of conventional or upper memory block memory needed by each program.

Software Digest Rating	Overall Evaluation	Overall Power	Program Name	Version Tested	Performance	Versatility	Error Handling	Ease of Learning	Ease of Use	Memory Requirement	Price	Volume Purchase Agreements	Page
✔ ★★★★★	9.3	9.7	Stacker AT/16	2.0	■	■	■	■	■	512K	$249	✔	24
✔ ★★★★	8.6	8.6	Stacker	2.0	■	■	■	■	■	512K	$149	✔	22
★★★	7.1	6.6	Expanz! Plus	2.1	■	■	■	■	■	512K	$199	✔	20
★★	6.7	7.5	SuperStor	1.3G	■	■				640K	$139	✔	26
★	5.9	5.4	Double Disk	2.5	■	■	■	■		512K	$100	✔	18

Ratings Key
(On a scale of 0 to 10)
OVERALL EVALUATIO
★★★★★ 9.0 or hig
★★★★ 8.0-8.9
★★★ 7.0-7.9
★★ 6.0-6.9
★ 5.0-5.9
ALL OTHER RATI
■ 7.0-9.9
5.0-6.
unde

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Read what the experts have to say.

You probably *need* more disk space. Right? If you're running Windows® you *must have* more disk space. So now, the question isn't *whether* you need data compression, it's *which* data compression product? So listen to the experts.

The independent testing labs of NSTL, Inc., recently completed the most in-depth and comprehensive study on data compression done to date. This Software Digest Ratings Report rates Stacker™ highest in performance, versatility, ease of learning and ease of use. In fact, Stacker AT/16 and Stacker 2.0 software are the *only* products "*recommended*" by the report.

But that's to be expected for Stacker. After all, it's won just about every major award in the industry. Now who would you trust your data to?

So what are you waiting for? Your disk isn't getting any bigger while you sit there.

Get Your *FREE* Report Now!

If you're like most PC users, your data is worth more than your computer. So get all the facts before you choose a data compression product.

Call us now for your free summary report!

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1-619-431-7474 In Europe call/fax Stac U.K. Phone (44) 734-776484 Fax (44) 734-894618

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STAC®

The Data Compression Company.

1990 ByteWeek Best of COMDEX

1991 PC Computing MostValuable Product

1991 PC Magazine Technical Excellence

1992 Byte Magazine Award of Distinction

1992 PC Magazine Editor's Choice

1992 Windows Magazine WIN Award

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Circle 271 on reader service card

Should Your Next Computer Be a Jeep?

The end of Intel's long monopoly on PC microprocessors is bringing higher performance, lower prices, and widespread confusion. Though bargains abound, it's become harder than ever to choose a PC. You must pay close attention because many Intel and Intel-compatible microprocessors offer similar part numbers and overlapping performance ranges, and PCs mostly take their names from their processors.

As Intel alternatives proliferate, just keeping the processors straight is a challenge. If you think you've got it down, answer these simple questions: Which is faster, the Cyrix Cx486SLC/25 or the Intel 486SX/20? Which has the larger cache, the IBM 486SLC or the Intel 486SX/25? Which has the faster math coprocessor, the Texas Instruments 486DLC/40 or the Intel 486DX/33? Which requires a socket for more pins, the Chips and Technologies Super386 38605DX/40 or the Intel 486DX2/25? Do you know if the AMD386/40 plugs into the special Intel sockets built into 486SX machines? Did you know that IIT has a 486-compatible chip nearing market, or that Cyrix and TI have a whole family of processors in the works, including clock multipliers?

It probably comes as no surprise that Intel is pushing ahead with a whole catalog of impressive new processors, including the "P5," which might have been but definitely won't be called the 586, and which might have but won't fit into a 486DX socket. Not far behind the P5 will come Cyrix's "M1," said to offer P5-like performance. God only knows what all these processors will end up being called, but knowing the names won't help you choose a PC.

Though you may not be able to figure out the very best bargain, bargains are everywhere. Cyrix introduced its 486SLC at a price of $119 in quantities of 1000, compared with $282 for the same quantity of Intel 80486SXs. Intel has now been forced to drop that price to $119. In fact, some large manufacturers say they're paying only $70 for 20-MHz 80486SXs, $80 for 25-MHz versions of the same chip, and $70 for the Cyrix Cx486SLC. With a math coprocessor, the Cx486DLC price has just been slashed to $119, or about one-fourth the cost of the 80486DX it replaces. Some manufacturers expect the AMD 386/40 to drop to $40 or less sometime this summer.

Cost benefits aside, the proliferation of processor model numbers is more a curse than a blessing for the perplexed PC buyer. Both you and the industry need names for classes of computers that are as meaningful as the names we use for cars. When you go car shopping, you don't look at all the cars that have the same engine with the same part number, the same number of cylinders, and the same number of cubic centimeters of displacement. More likely, you try all the sports cars under $20,000, all the station wagons that seat six adults, all the performance sedans, or all the budget subcompacts.

The time has come to leave behind bits, bytes, caches, and clock speeds and review computers in groups meaningful to you. Rather than focusing on computers that have an identical Intel engine, we'd like to include systems with engines from other vendors. And we'd like to find product categories at least as useful and descriptive as those applied to cars.

We have some ideas for grouping different types of PCs. We've considered designating computers according to the types of people most likely to use them (executives, secretaries, frequent travelers), or by the most likely setting for their use (office, home-office, travel, all-setting), or by performance or price range—you might want us to review the best 25 computers under $3000, or the best under $2000. We could even take a cue from the fashion industry and cover the manufacturers' new lines for spring, summer, fall, and so forth. The possibilities are boundless when Intel's CPU isn't the sole determinant.

ANDREW FAULKNER

You've been responding by the thousands to our fax-back surveys, like the one on page 283 of this issue, so we decided to invite your recommendations. Please let us know what kind of classification scheme you'd find most convenient and meaningful. We're doing this as a write-in because we'd like a broad range of suggestions, not just your reaction to our ideas so far. So think it over for a while and then turn to the survey and fax us your thoughts. Besides helping us move PCs beyond industrial jargon and into the fabric of ordinary life, you'll be entering a drawing for a free 200MB hard drive.

Phil Lemmons

PHIL LEMMONS
EDITOR IN CHIEF

THE COMPAQ DESKPRO/i. SO M
A LIMITED PRICE LEADS T

The company most qualified to advance the state of the desktop computer announces four systems that represent a breakthrough in R&D. At prices that won't ruin your P&L. Reflecting the level of thinking and quality that you've come to expect from Compaq.

At Compaq, there's a fundamental belief held by all of us that when you set extraordinary goals, extraordinary people will meet them.

Recently, for example, you made it clear to us that you wanted new PCs, with everything from advanced graphics to audio capability to affordable prices. Our response: the COMPAQ DESKPRO/i Family of PCs. Four new systems loaded with features to enhance productivity.

The built-in COMPAQ QVision 1024 Graphics Controller, for example, allows you to scroll, resize windows and pull down menus up to ten times faster than most popular video graphic subsystems. So quickly, as a matter of fact, you may find your computer waiting for you. Instead of the other way around.

Its unique processor upgrade path ensures that your PC won't be swept into obsolescence.

Simple chip upgradability and a 64-KB cache

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MUCH FOR THE IDEA THAT TO LIMITED THINKING.

memory module option provide quantum leaps in performance. Without

Intel 386/25, 386/33, 486SX/25, 486/33 « *QVision accelerated graphics* « *Chip upgradability* « *Integrated business audio* « *4 MB RAM (expandable to 32 MB)* « *Cache memory standard* « *3 ISA expansion slots* « *3 drive bays* « *84-MB to 510-MB hard drive options* « *Multi-level security features* « *Microsoft MS-DOS 5.0 as published by Compaq*

similar outlays of cash.

The fully integrated audio system brings an unprecedented, yet not unfamiliar dimension to mainstream business computing: your voice. The result of a collaboration between Compaq and Microsoft, it allows you, among other things, to actually paste voice messages into spreadsheets and documents. Either as notes to yourself or as voice-mail across your entire network.

And we've engineered this breadth of technology right onto the PC's system board, preserving the small footprint, large storage capacity and expansion of the COMPAQ DESKPRO/i.

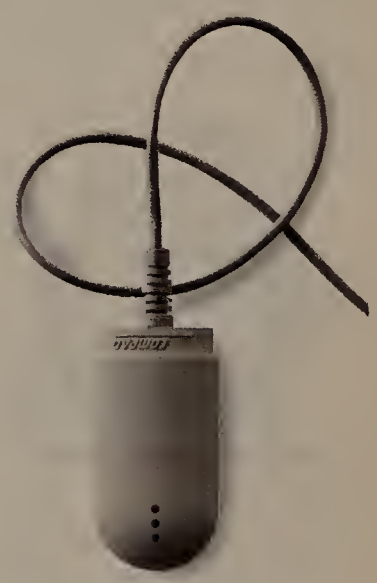
Not to mention your financial integrity.

Add CompaqCare, a new service and support program with our free, one-year, on-site* limited warranty. An Asset Management Provision that gives you and your network administrator a snapshot of your PC's configuration. And you have nothing short of a system that breaks a lot of new ground. Without breaking the bank.

For more detailed information, just call us at 1-800-263-5868, ext. 210 in Canada, or call us at 1-800-345-1518, ext. 210 in the U.S.

We bet you'll be as excited about the COMPAQ DESKPRO/i as we are.

In scrolling, window resizing and accessing menus, our new QVision accelerated graphics beat the competition by as much as 10 to 1.



You can paste voice messages into Microsoft Windows 3.1 business documents and spreadsheets with our integrated business audio system.

intel inside

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The Intel Inside logo is a trademark of Intel Corporation.

Circle 83 on reader service card

AN INEXPENSIVE PC THAT FROM THE COMPANY TH

What happens when the best computer engineers in the world design a low-priced desktop PC? You get the new COMPAQ ProLinea Line of PCs, perhaps the best value PCs in the world. What happens when a clone maker designs a low-priced PC? You get what you pay for.

When Compaq engineers set out to build an affordable, full-performance desktop PC with all the essential features, there were a lot of options to choose from.

We could have bought an existing low-end computer company.

We could have farmed out all manufacturing.

We could have bought parts from the cheapest vendor in town.

But then all we would have ended up with is simply another inferior,

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T'S AS GOOD AS A COMPAQ. HAT OUGHT TO KNOW.

low-priced clone. And what we wanted was a low-priced COMPAQ computer.

Which is what you told us you wanted.

So through some high levels of chip integration and some equally high levels of engineering, design and just plain common sense, we've cut costs in system design and manufacturing.

Intel 386SX/25 « *small footprint* « *2 MB RAM* « *2 ISA slots* « *2 drive bays* « *40- or 84-MB hard drive*
Intel 386SX/25 « *2 MB RAM* « *3 ISA slots* « *3 drive bays* « *84- or 120-MB hard drive*
Intel 486/33 « *4 MB RAM* « *3 ISA slots* « *3 drive bays* « *84- or 120-MB hard drive*
All models include high-resolution 1024 x 768 video and pre-installed Microsoft MS-DOS 5.0 as published by Compaq

While still managing to deliver 100 percent of the virtues you've come to expect from Compaq.

You can choose from three different models, opting for either Intel 386SX/25 or 486/33 processing power.

So whether it's expansion, storage, processing speed or a small footprint that you're most concerned with, there's a model perfectly suited to your needs.

And each comes with a high-resolution 1024 x 768 video system.

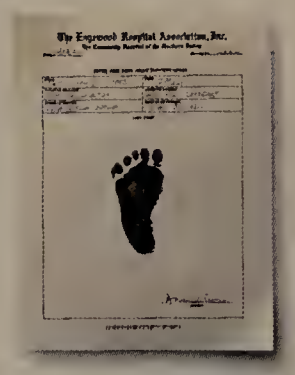
Most importantly, the new COMPAQ ProLinea PCs are backed not only by the assurance of the COMPAQ name, but also by CompaqCare, our new service and support program. Which includes a free one-year, on-site* limited warranty, and a host of other services.

And to go along with our new line of PCs, there's a whole new line of places you can find them. Give us a call for more details.

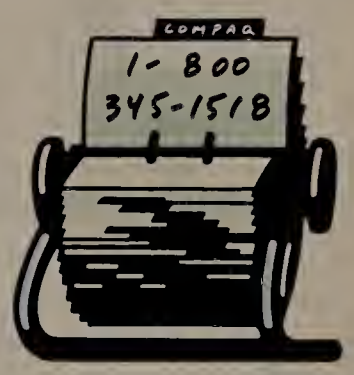
In the U.S., call us at 1-800-345-1518, ext. 215, and in Canada, just call 1-800-263-5868, ext. 215.

We think you'll be pleasantly surprised at exactly how much the COMPAQ ProLinea PCs have to offer.

And equally surprised by how little we're able to offer them for.



All in all, the COMPAQ ProLinea 3/25zs PC sizes up quite nicely. At a mere 12.6" x 14.9" x 3.5," it's one of the smallest footprints in the industry.



All of our models are backed by CompaqCare, our comprehensive new service and support program. For details, just call 1-800-345-1518.

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Circle 83 on reader service card

HP's PaintJet XL300. Now, brilliance doesn't require genius to install.

At last. A 300 dpi color printer that's as easy to add to your system as a LaserJet.

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Vivid color has never been so simple. The new PaintJet XL300 inkjet printer gives you laser-quality color graphics, text, and the compatibility of HP LaserJet printers. All for the remarkably low price of just $3,495.*

The PaintJet XL300 has LaserJet compatibility built right in. The same typefaces. The same page formatting. It also has PC/Macintosh auto-switching, so users in a mixed environment can share. And, just like a LaserJet, the PaintJet XL300 becomes network-ready with optional HP JetDirect interface cards.

Get laser-quality printing on a choice of media that includes plain paper and transparencies. Or add Adobe® PostScript® for access to even more graphics applications.

See how easily the PaintJet XL300 can bring color to your system. Call **1-800-752-0900, Ext. 3158** for a free print sample and the name of the authorized HP dealer nearest you.†

HEWLETT PACKARD

Circle 114 on reader service card

LETTERS

Reactions and responses from the PC World community

Scam!

I always thought the objective of computer magazines was to help sell new products. Now I see that *PC World* has come of age with "Consumer Watch Special Report: Scam!" in May. The suspicion that you're in business just to keep others in business came to an abrupt halt with this hard-hitting exposé.

WILLIAM R. FITZGERALD
PHOENIX

Back in November I bought a laser printer from the now-defunct Global Electronics. I was suckered into the "best deal anywhere" only to pay for the printer and never receive it. When I saw Mike Hogan's story on mail-order fraud in February ["Did You Buy Your Products Here?" in *Top of the News*], I called him. Mike did more investigating than the appropriate consumer groups or the Better Business Bureau even hinted at doing. Though I'm sure I'll never see my money or the printer, it's nice to know someone cares. Even though these guys will never get caught or punished, consumers will learn—pay by credit card, and only after you receive the product. I know that *PC World* has gone out of its way to find these bandits, and I, for one, appreciate it. Thanks and a tip of the hat to Mike Hogan.

DAVE TAGERT
FORT WALTON BEACH, FLORIDA

I would like to suggest that you add a tip to the sidebar "Ten Tips for Buying Direct," which appeared in "Scam!"

Tip 11: Don't believe everything that you read in computer advertisements. Before placing your order, make a test call to the company to find out how promptly the employees answer their published technical assistance telephone number.

This bit of friendly advice is offered by a *PC World* reader who learned the hard way.

GORDON L. FROEDE
LOS ANGELES

Or check PC World *reviews. As part of our review process, we call the technical support numbers of manufacturers and distributors —Ed.*

KAZU

As one who was burned by One Stop Micro, I commend *PC World* for its investigation. "Scam!" provided enough clues and evidence for everyone but the authorities. Unfortunately, even if thorough investigative reporting nails fraudulent mail-order firms to the attorney general's door, he will do no more than order the custodian to sweep them under someone else's rug.

MARC STALEY
TAMPA

We read "Consumer Watch Special Report: Scam!" with great interest. We certainly share the concerns you expressed. The information provided in your "Ten Tips for Buying Direct" contains excellent consumer advice. If these ten steps are followed before a product is purchased, some of the problems covered in your article should be alleviated. We only regret that similar tips are not used by publications before accepting advertisements. Although the Postal Inspection Service has a Publication Monitoring Program, it's impossible to review every advertisement placed in every publication nationwide.

We have received complaints about some of the companies you mentioned in "Scam!" On the basis of these complaints, we have authorized an investigation to determine if there is sufficient evidence to support a mail fraud prosecution. We are working with another federal law enforcement agency, sharing information to maximize the effect of our limited resources.

Any information that bears on the subject, particularly unresolved consumer complaints, should be forwarded to the Regional Chief Inspector, 850 Cherry Ave., San Bruno, CA 94098-0100. If appropriate, evidence will be presented to the U.S. Attorney's Office, where the decision to prosecute will be made. I would be delighted to be able to report to you in the near future that our efforts have been successful.

L. E. MAXWELL
MANAGER
FRAUD AND PROHIBITED MAILINGS BRANCH
CRIMINAL INVESTIGATIONS
U.S. POSTAL SERVICE
OFFICE OF THE CHIEF POSTAL INSPECTOR

PC World *has forwarded all the complaints we received to the Regional Chief Inspector. We will report on any developments as they occur. —Ed.*

ANTHONY RUSSO

What Next?

The *What Next?* column in April kept me from canceling my subscription. I used to consider *PC World* the authoritative source on PC developments. In recent years, I think the magazine has become infested with press releases. Hogan's candid assessment of *Windows* convinced me to wait a year to see what the magazine is going to be—a shameless drumbeater for Microsoft or an analyst of the computer industry.

FORREST RHOADS
VIA MCI

DOS vs DOS

I was disturbed by the comparison between MS-DOS 5.0 and DR DOS 6.0 ["DOS vs DOS"] in April. Specifically, I'm bothered by the attitude of Microsoft's corporate desk thumpers toward those of us who have DR DOS and want to run *Windows*. The *Windows* literature never mentions a problem with DR DOS and *Windows 3.1*. I found out the hard way when I purchased *3.1*. Microsoft has apparently forgotten that, from the customer's perspective, competition in the marketplace enhances price, service, and products.

PHILIP E. HODGKINS
SAVANNAH

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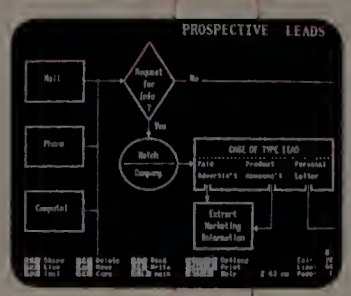

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Multimedia-Ready CD ROM Drive

Thanks for the wonderful 3½-star rating you gave our Todd TCDR-7000 in your review "CD ROM Drives: 680MB or Bust!" in May. We also have a multimedia-ready model, the TCDR-7000M. Although it lacks the key-lock feature of the TCDR-7000, the 7000M comes with an RCA audio jack and a cable for connection to an audio system.

JOAN BERNHARDT
PRODUCT INFORMATION COORDINATOR
TODD ENTERPRISES, INC.
BAYSIDE, NEW YORK

GUI of Choice

A vocal group of readers on PC World Online have discussed the amount of your *Microsoft Windows* coverage; many wish you gave more coverage to *GeoWorks Pro* or *GeoWorks Ensemble*. I agree. While *Windows* looks like it will be a part of the "exciting future" of computers, there are other GUIs on the market now and more on the way. How about fully covering those software systems?

MICHAEL
VIA PC WORLD ONLINE

We plan to—you can look forward to comparisons of Windows *and other multitasking graphical user interfaces in upcoming issues. —Ed.*

Informed Conclusion

George Campbell's glowing description of Microsoft's *Word for Windows 2.0* in April's "Windows Word Processors" failed to point out that *Win-*

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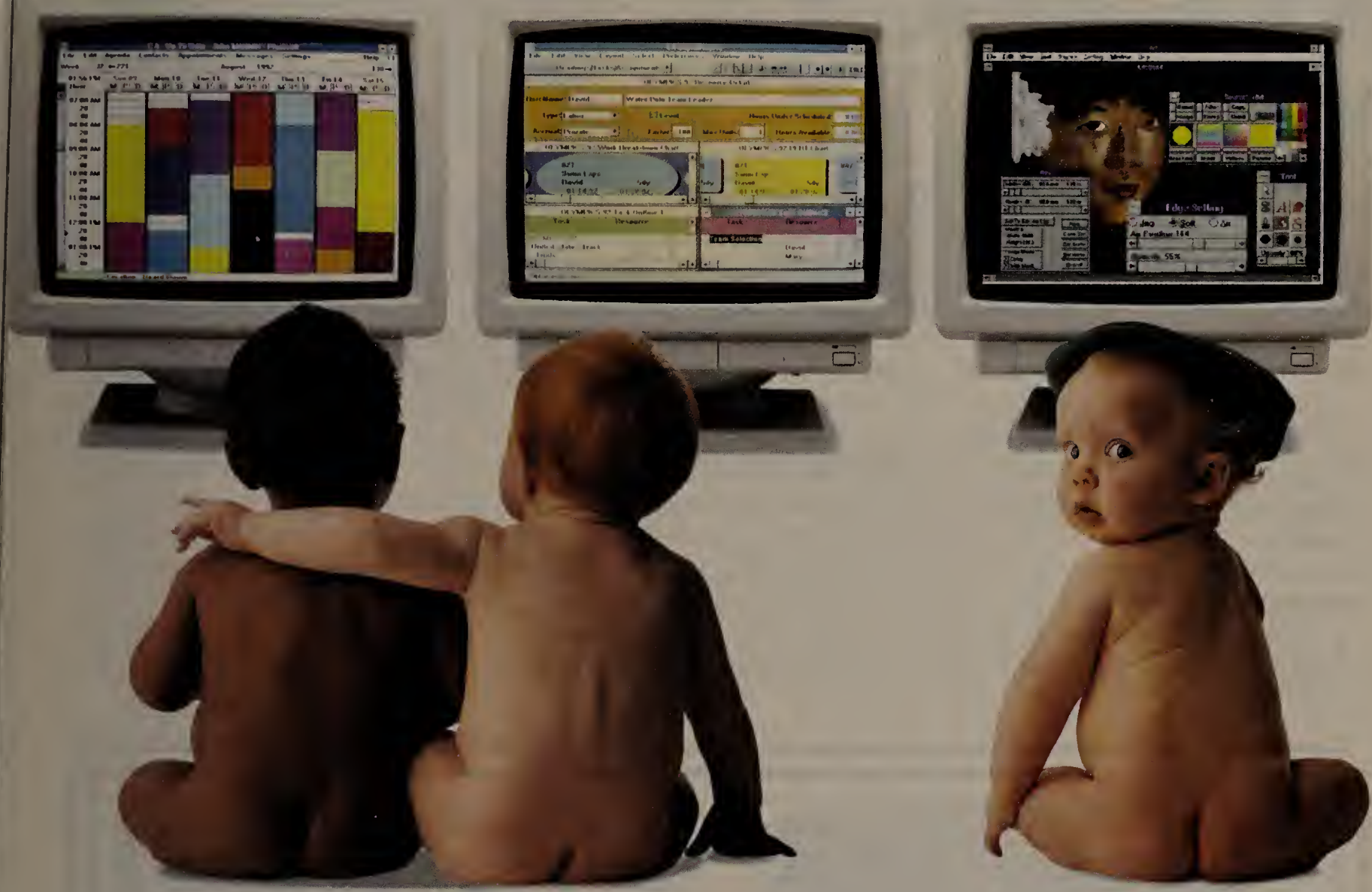

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Word 2.0 cannot print TIFF formatted images. His assertion that "*Ami Pro*'s handling of scanned images is superior to *WinWord*'s" is understatement at its best. Don't you know that people base software purchases on your conclusions?

FRANK E. WEIR
GALT, CALIFORNIA

Early releases of Word for Windows 2.0 *had trouble interpreting gray-scale TIFF images. Many gray shades printed too dark. This problem has been fixed in later releases and in version 2.0a. If you purchased an early copy of* WinWord 2.0, *you can download a new gray-scale driver from Microsoft's online service (206/936-6735) that will fix the problem. Or call Microsoft technical support (206/462-9673).— George Campbell*

Large Partition Blunder

In the April *Letters* column, your response to David T. Griffith, Jr.'s question about partitioning hard drives said, "Compaq's version of MS-DOS 3.31 supports large partitions. However, no one else's does." I would suggest that you verify all the facts prior to making such blanket statements. I have been using *ZDOS 3.31,* and it supports large partitions.

JAMES M. PERCIC
SAN FRANCISCO

Our readers have informed us in no uncertain terms that we dropped the ball with that response. Our apologies. The editor responsible for the rash comment is now a humbled shadow of his former self. —Ed.

Get the Right FCC Rating

When purchasing a 486 machine for home use, make sure it has an FCC Class B rating. With the increasing home use of these formerly "industrial strength" machines, the Class A rating, which allows a computer to be used only in commercial or industrial areas, will not suffice. The unwary purchaser of a Class A–rated 486 for home use will likely be inundated with neighbors' complaints about TV and radio interference. A would-be purchaser would be wise to get the system's FCC number from the vendor and verify that system's rating with the FCC.

WILLIAM SCHWARTZ
BROOKLYN

Remote Disappointment

I was disappointed by "Remote Communications Software: The Next Best Thing" in February. After reading it, I bought *Close-Up Dual Pack 4.0,* which was recommended in the article. I then found that not only did it not work reliably, but its performance was dismal (especially with graphics programs). It operated at about one-hundredth real time on my 386 computer with a 2400-baud modem.

MICHAEL NAGY
SAN RAMON, CALIFORNIA

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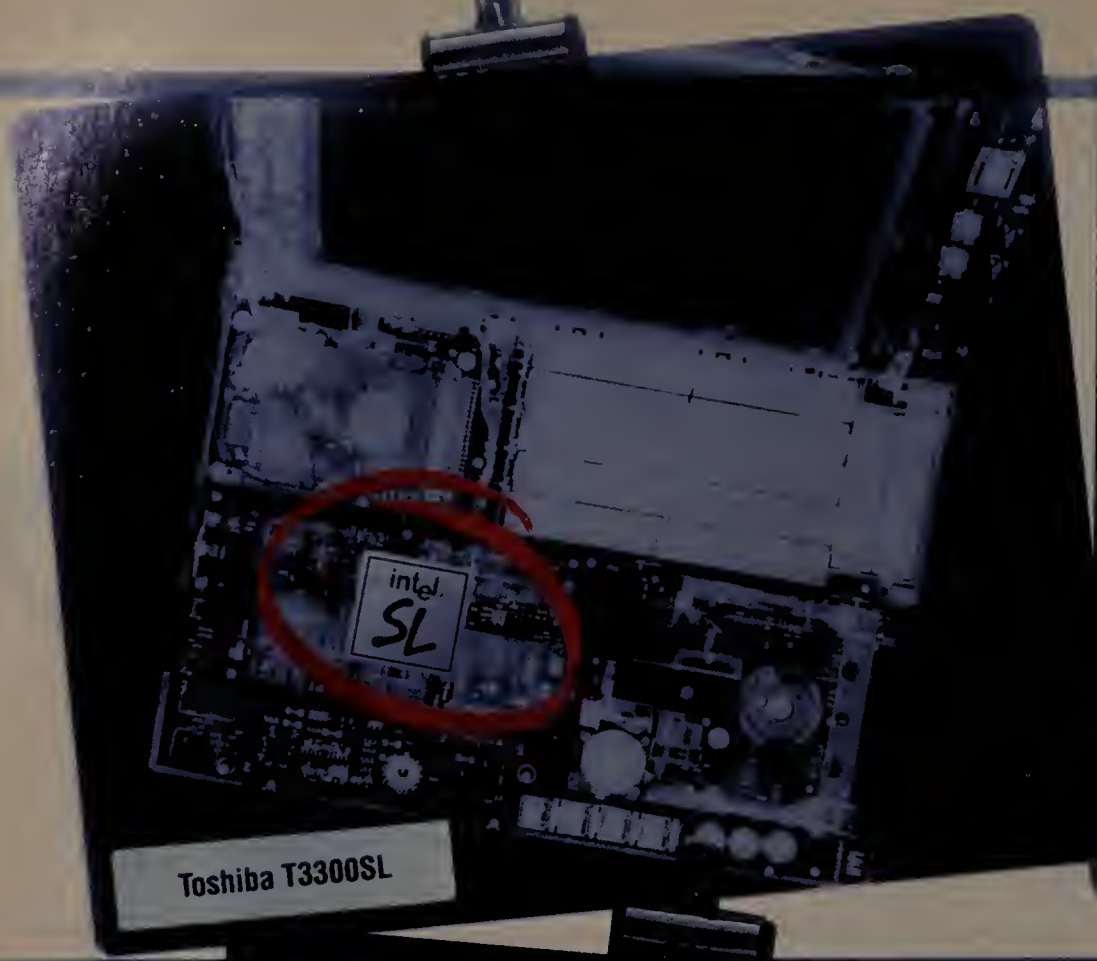

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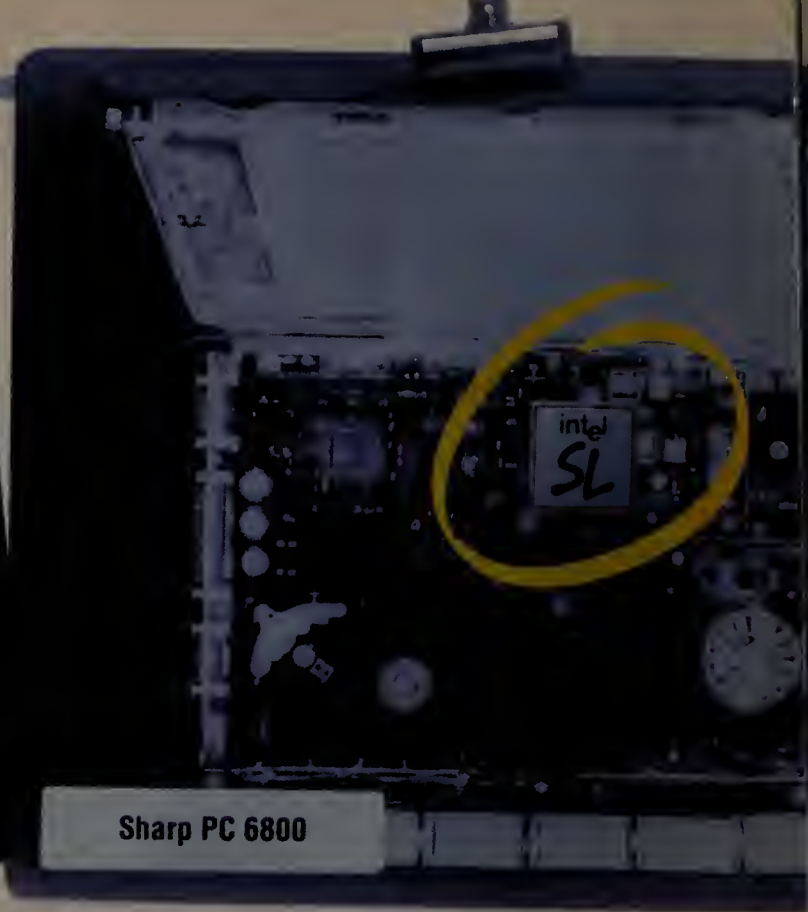

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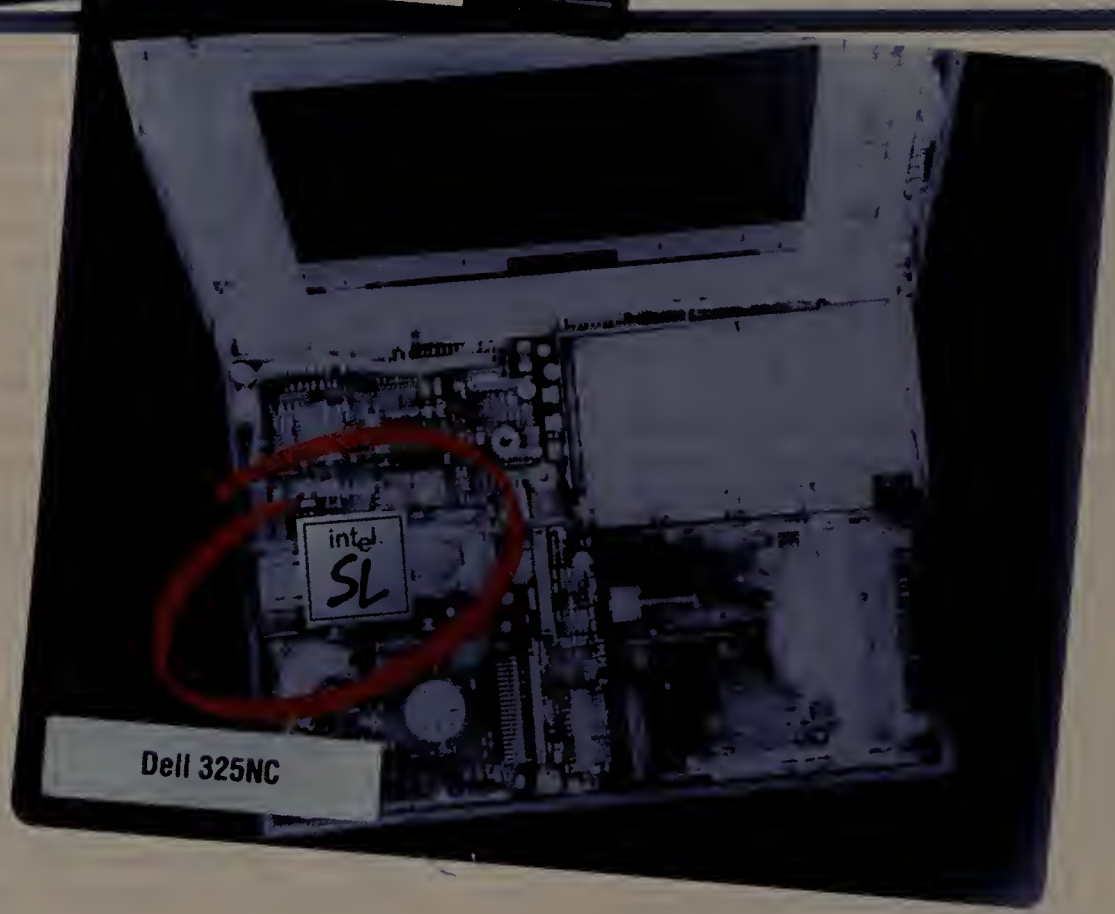

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Take a closer look at some of the best notebook computers and it's easy to see why the prognosis is so good—they each have an Intel SL microprocessor. The Intel SL gives each of these unique notebooks a leg up, because it was designed specifically for the stop-and-go world of mobile computing.

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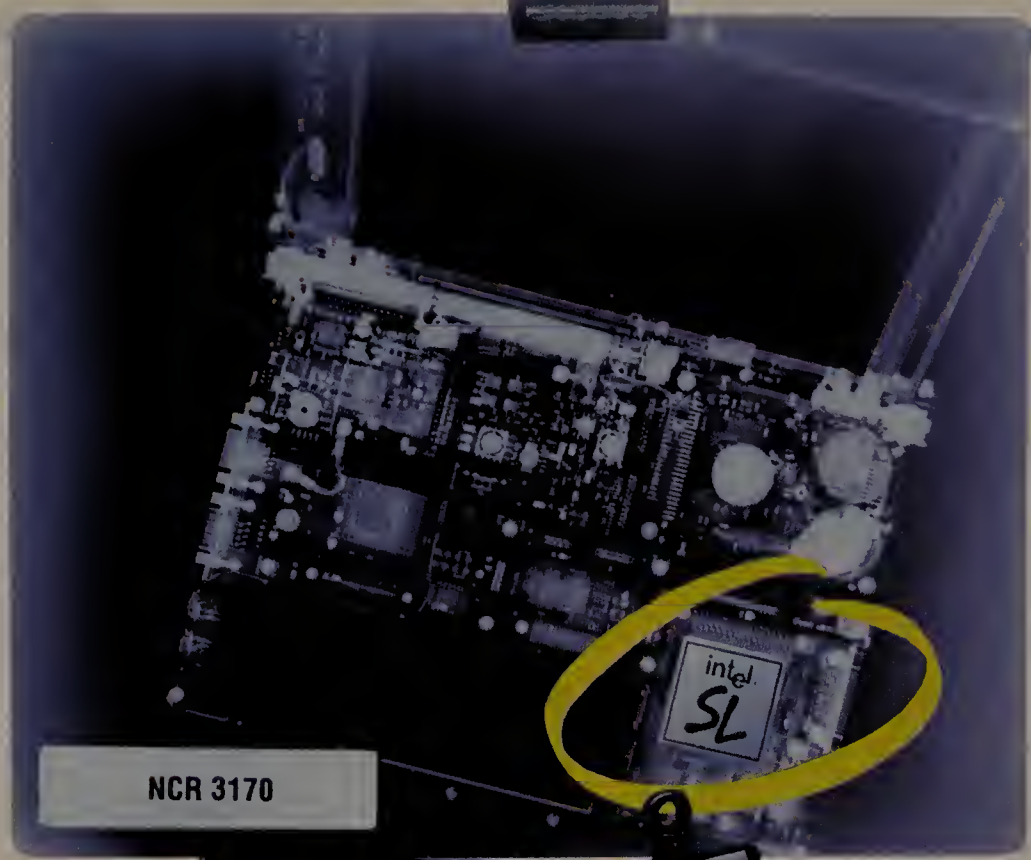

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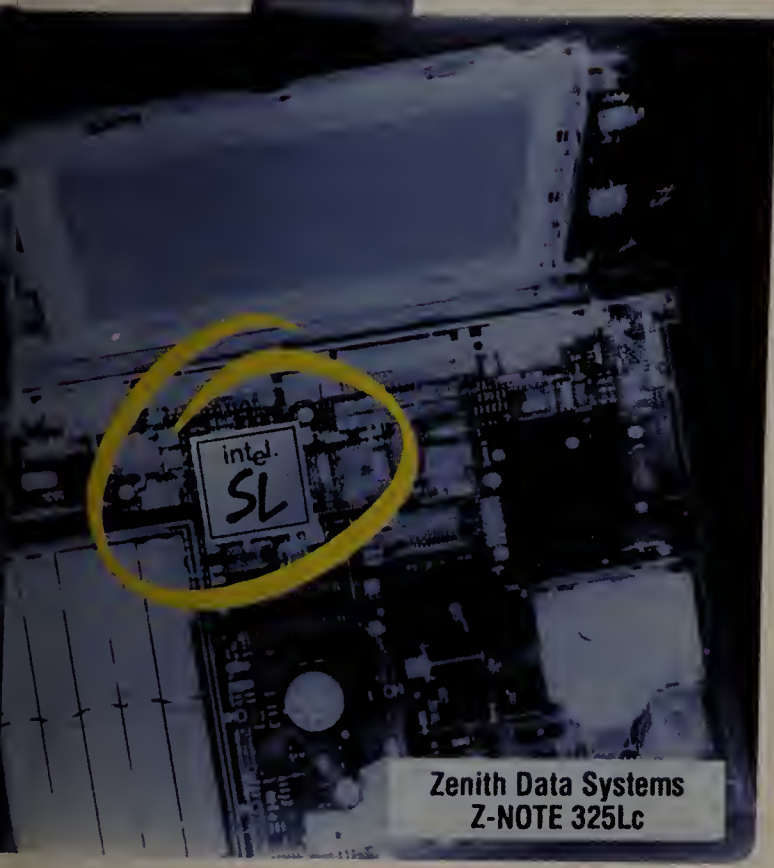

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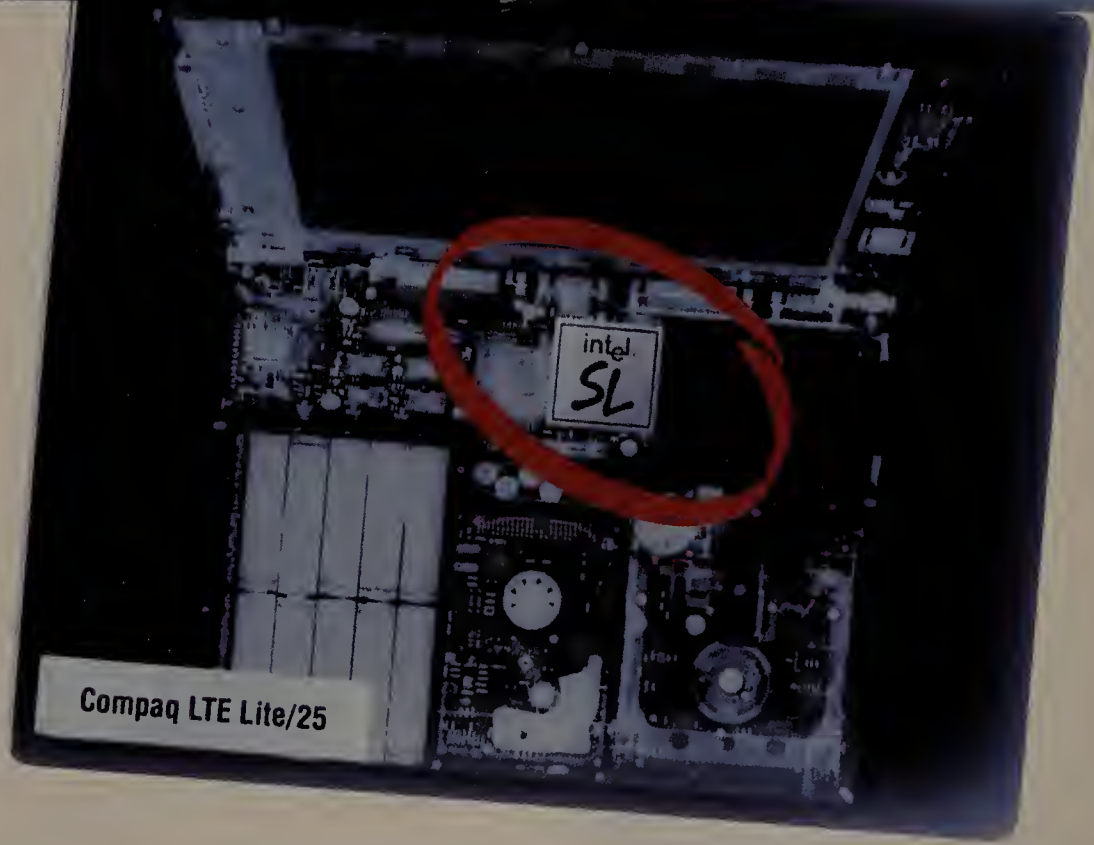

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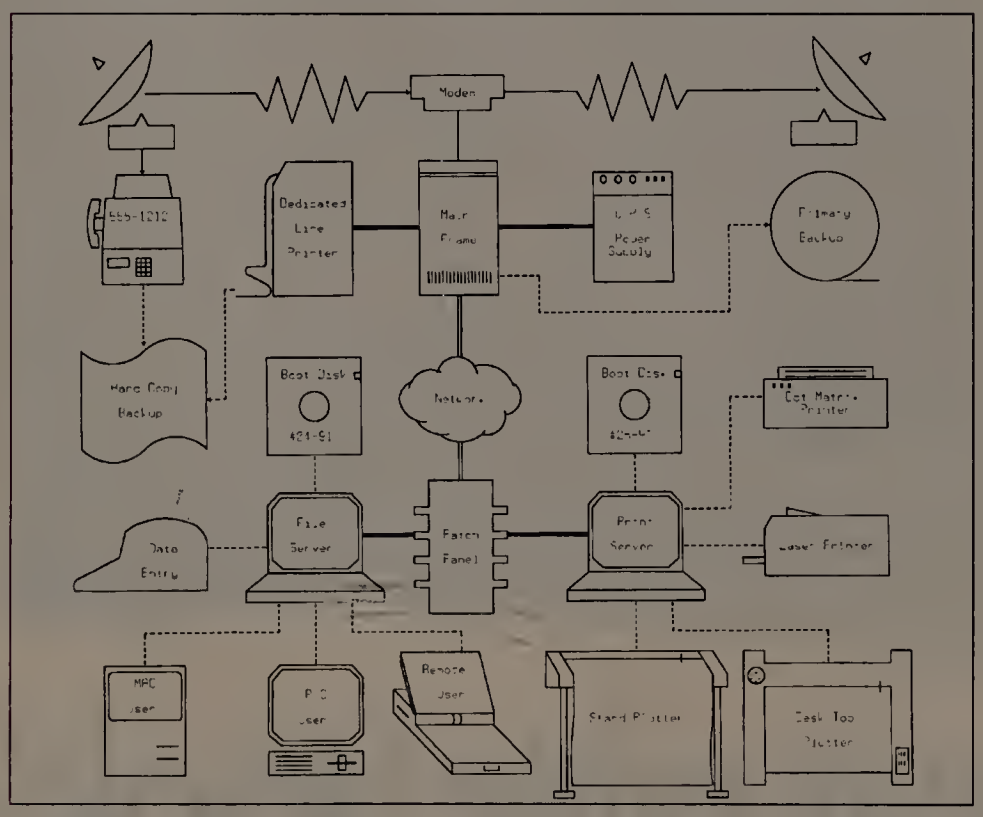

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While we found Close-Up Dual Pack 4.0 *to be the best package available, the fact is that working remote is slow—especially if you're sending graphics over a 2400-baud modem. —Judy Heim*

Wrong InCommand

We appreciate the announcement of *InCommand 1.3* on page 114 in April, but it contains an error: Users should type **DI ...*.TXT,.DOC** to list all files with TXT and DOC extensions in the current directory and its subdirectories.

ERIC L. MICHELSEN
PRESIDENT
INDUCTIVE LOGIC
SAN DIEGO

Power Blooper

Power Tip No. 243 on page 290 in April has an error. Your replicate function contains "**-1**" as the code to put a dashed line between Lname and Rank. It should be only "**-**" unless you want to print -1-1-1-1... between every data set.

DAVID MACLAY
LOS ANGELES

Off-Color Printer

In "Color Printers Come Through" in May, Dan Miller indicates that the HP DeskJet 500C is able to print in color from *WordPerfect 5.1*. I talked to HP, and they say the only color driver available is for the DeskJet 500. How did you print in color from *WordPerfect 5.1?*

STEVE MUNSON
BUTTE, MONTANA

We should have added a footnote stating that we ran the WordPerfect *test on a DeskJet 500C in monochrome mode. The 500C doesn't yet have a color driver for* WordPerfect. *—Dan Miller*

Mail your reactions, responses, and ideas to Letters, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Letters; CompuServe, 74055,412; MCI Mail, PC World Editorial; or 415/442-1891 (fax). Include your name, city, state, and phone number. We reserve the right to edit letters.*

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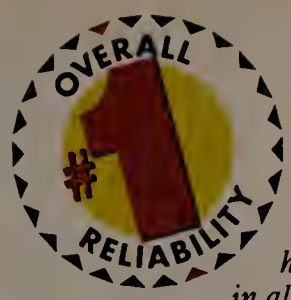

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THE INTELLIGENCE OF THE 386SL CHIP.

Intel designed the new 386SL processor specifically for notebooks. And they were right on target! According to *PC Magazine*, this sharp new processor "promises to extend the battery life of portable PCs significantly, not by drawing less power but by being intelligent enough to power-down the memory, disks, modem, video and ports when they are not in use. The results can be impressive..."

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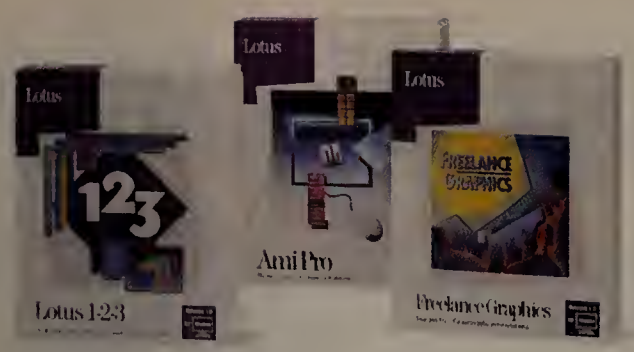

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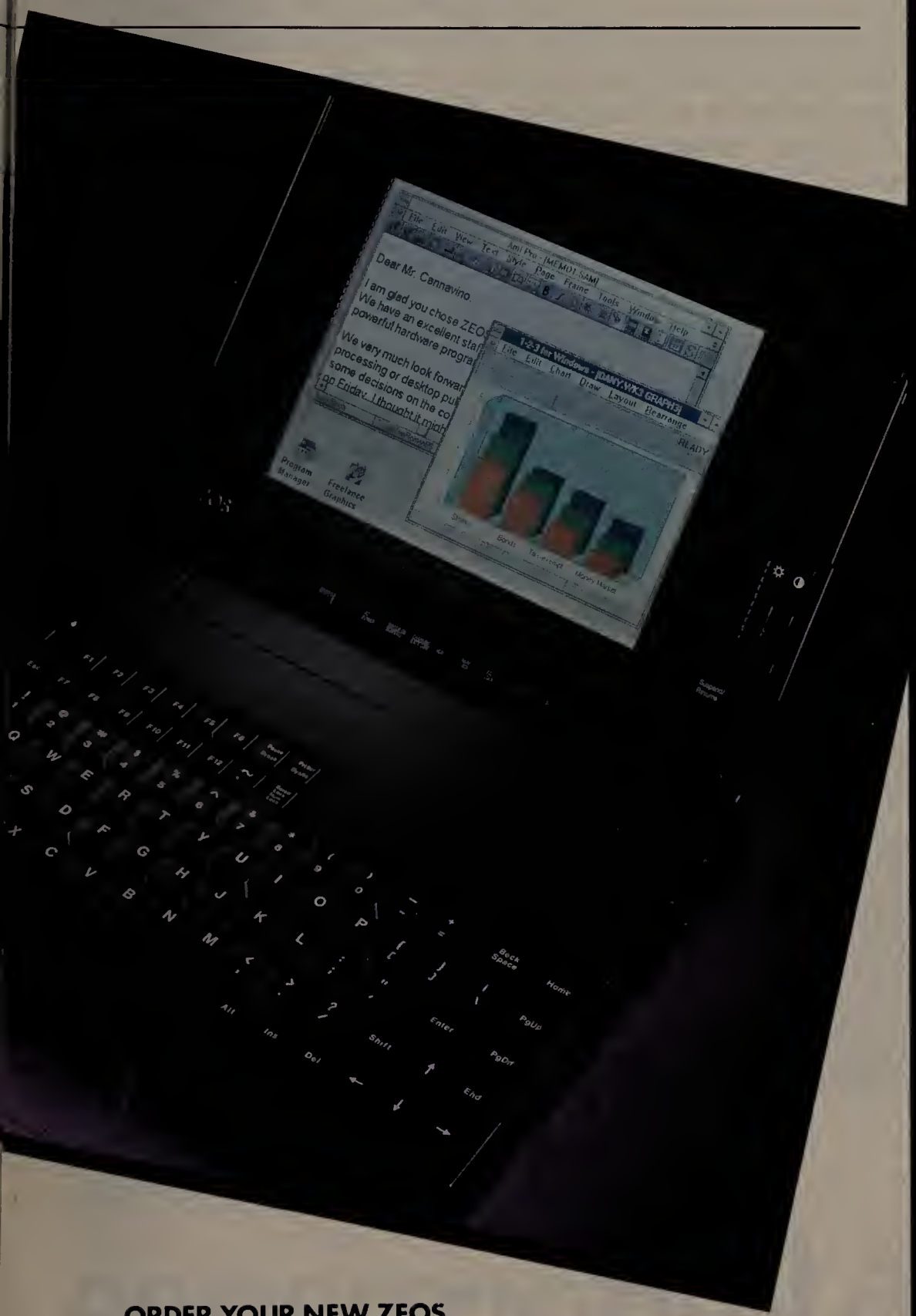

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CONSUMER WATCH

BY ROBERTA FURGER

Advice and information for the computer consumer

Scam Update

In May, "Consumer Watch Special Report: Scam!" detailed the workings of several Los Angeles mail-order companies that systematically defrauded dozens of consumers by taking money for orders that were never shipped. The story also recounted the failure of law enforcement officials to pursue the matter actively and urged the local, state, and federal agencies with jurisdiction to take immediate action. Since the article was published, the Los Angeles County District Attorney's Office has initiated a preliminary investigation into the suspect companies. The U.S. Postal Inspector has also authorized an investigation to determine whether there is "sufficient evidence to support a mail fraud prosecution" (see *Letters*).

CONSUMER WATCH

SCAM!

HOW A GROUP OF LOS ANGELES MAIL-ORDER COMPANIES RIPPED OFF CONSUMERS, DISTRIBUTORS, BANKS, AND PUBLISHERS AND WHY THEY'RE GETTING AWAY WITH IT

Investigator Rick Harrison of the Garden Grove Police Department reports that the Orange County District Attorney's office has declined to prosecute a case against American Computer Technology (ACT) owner Michael Thomas Lytle, whom Harrison was investigating for fraud.

"I had three witnesses willing to testify," says Harrison, "two from California and one from Mexico City." But according to the DA's office, three victims are not enough to prove that ACT was involved in a pattern of fraudulent activities, and it would be too expensive to fly in other victims from out of state to testify.

We've also heard from several more people who dealt with these companies. One consumer who got caught in their net was Daniel Nichols, a computer programmer in Redondo Beach, California. Nichols ordered a motherboard from One Stop Micro of Van Nuys in July 1991. After weeks of trying to deal with the company over the phone, he went to its warehouse in Torrance, California, intending to get the product he ordered —or his money back. At the warehouse, Nichols found a woman answering two phones—one for "One Stop Micro," the other for "Minuteman Computers" (another company mentioned in the May article). When Nichols asked who was in charge, a salesman wrote "Tony Palomino" on a slip of paper. Palomino is the individual who sources say started the ring of mail-order companies.

Nichols hounded One Stop Micro until the company credited his charge account for the product he never received. "I called them daily every 15 minutes until they sent me a slip showing I'd been credited the amount owed," says Nichols. During his dealings with One Stop Micro, Nichols reports that one salesperson at the Torrance warehouse questioned his concern about getting a refund. "If we were ripping you off, the bank would charge us back anyway," the OSM employee told him. In fact, several banks are out thousands of dollars after crediting their customers' accounts for orders never shipped.

Take Action!

Have you dealt with One Stop Micro, Minuteman Computers, American Computer Technology, Computer Spectrum, or any of the affiliated companies mentioned in the May article? We'd like to hear about your experience.

We'll continue to investigate these companies and report any developments.

What's the Value of Outdated Software?

I never realized how quickly software disks can accumulate. I now have 15 plastic disk cases full of outdated software going back to the birth of the PC. I've got copies of *VisiCalc, Windows 1.0, Multiplan 1.6, Hacker II for the Apple,* and Commodore 64 software.

I would probably save a small fortune if I just relabeled and reformatted all the disks, but for some reason I can't bring myself to format over *Windows 386* and just pitch the documentation.

What should I do with this software—documentation and all? Does it have any value? Do the software companies offer any incentives for returning old software?

E. Williams, Jr.
Detroit

ANTHONY RUSSO

Editor's note: As a general rule, when you upgrade to a new version of an application, you should destroy the previous one, because the software license entitles you to only one copy, according to Jodi Morrison, litigation coordinator for the Software Publishers Association in Washington. You may, however, donate the software to a nonprofit group, even if you're using a later version of the same application.

CompuMentor, in San Francisco, is one of several nonprofit organizations that distributes software to needy groups. According to spokesperson Bruce Ackley, CompuMentor welcomes individual software contributions, provided the application is still usable and all the original disks and documentation are intact. You can reach CompuMentor at 415/512-7784.

If you no longer use an application, you can also give it to a friend, provided you don't keep a copy for yourself, says Morrison. "If you're a registered user, you should also contact the company and let them know you've given the software away," she adds.

Finally, you may want to keep old copies of Windows 1.0 *or the original version of* VisiCalc, *says Dr. Gwen Bell, director of collections for The Computer Museum in Boston. But don't expect them to be worth anything soon. "It's a question of supply and demand," says Bell. The longer you keep the software, the greater the chance it'll be worth something. "The nice thing about software is it's small. You can put the disks away for 20 years. By that time, plenty of people will have thrown things out."*

Research Pays Off

We often write about the importance of investigating companies from whom you're considering making a purchase, but few of us enjoy spending the time required to research a purchase. Two readers saw firsthand the benefits of making the extra effort.

When I was ready to move to a 386 computer I called several vendors and narrowed my choice to Dell, Austin, and Northgate. I sent a list of specifications to all three companies, requesting a price quote. Only Northgate bothered to respond. I bought the Northgate and found their support to be exemplary. They kept in close contact, notifying me when the machine shipped. Since the system was delivered, I have used Northgate's phone support, which has been far superior to the support I formerly received from the local dealer.

ROBERT A. KLEIN
POTOMAC, MARYLAND

In early January, 1992, I faxed letters to 20 computer manufacturers detailing my specifications for a new computer. Centrix Computer of Industry, California, was one of only three companies to respond. It also had the most appealing price.

I then tested the company's technical

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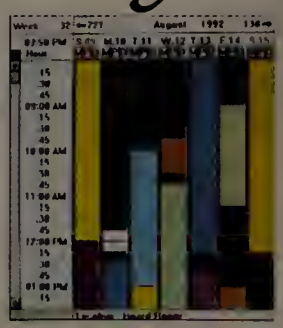

conference room, search for a free time block, send a memo to a hundred people, schedule a meeting for 25 differ-

support by calling for information on two occasions. Each time I called, I received prompt and accurate answers to my questions.

My computer was up and running six days after I ordered it.

JIM RODEMEYER
ALTUS, OKLAHOMA

Where's My Rebate?

As a user of an early version of *Quicken,* I received a notice from Intuit last November about a special deal if I upgraded to *Quicken 5.0* or *Quicken for Windows.* Since I was in the process of buying a new, *Windows*-capable computer, the latter option was of interest to me.

In its promotional literature, Intuit said that there were two ways a user could obtain the upgrade: Either buy the product directly from them, or "find the best deal" at a local software store and send the receipt, along with Intuit's personalized rebate certificate, and receive a $15 rebate.

I found an excellent price on *Quicken for Windows* at a local Babbage's software store, and duly sent in the rebate request to Intuit.

When I didn't get my rebate check, I wrote to Intuit to inquire about it and received a form letter indicating that I had purchased my copy at a store offering an instant $15 rebate and was therefore ineligible for an additional rebate. This was a shock to me, since I hadn't received an "instant rebate."

I checked with Babbage's and found that they did indeed offer an in-store rebate on *Quicken for Windows,* but I had no way of knowing this, since Intuit had not told me of the program and there was no notice of it in the store.

The store manager was kind enough to write a note to Intuit explaining that I had not received a rebate through them. I sent this information to Intuit but have received no reply.

JUDITH HEISSERMAN
FAIRLAND, INDIANA

Editor's note: We contacted Intuit and discovered that several Quicken *users were confused by the rebate offer.*

According to Melissa Menge, Intuit's channel program manager, the rebate program, which ran from October through December of last year, was originally a mail-in program only. Several retailers subsequently decided to offer customers an instant rebate. Retailers, however, did not always require customers to submit the rebate coupon.

"It was never our intention to offer more than one $15 rebate," says Menge, "nor was it our intention to mislead customers." According to Menge, although it's still Intuit's policy to allow only one rebate per customer, the company is making exceptions in cases where customers are "clearly confused" by the rebate program.

Ms. Heisserman is among those receiving a rebate.

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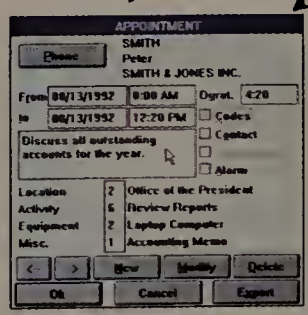

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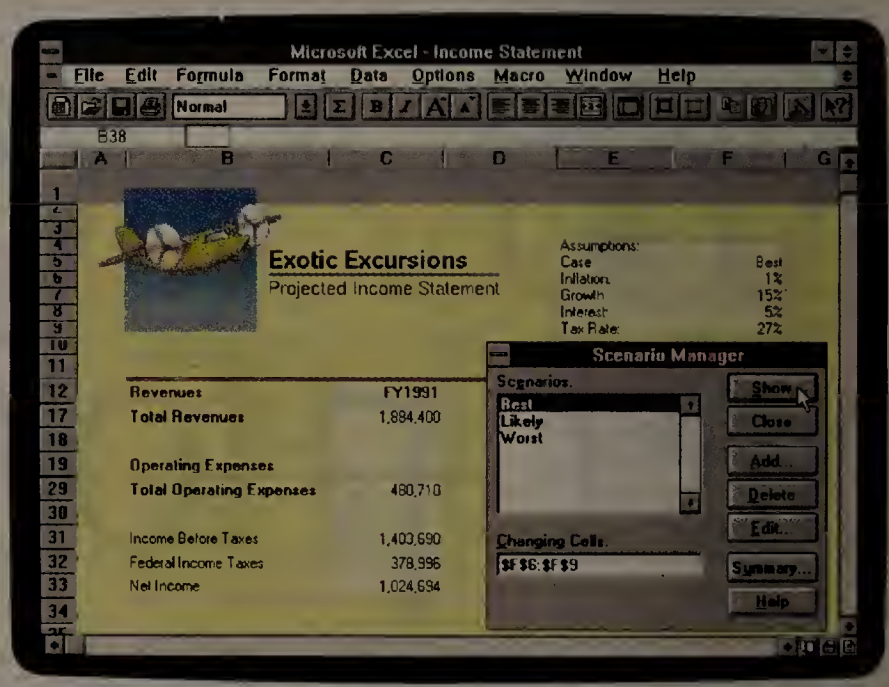

The Scenario Manager is a powerful analysis tool that lets you easily create and save multiple "what if" scenarios, then instantly produce nice-looking summary reports. (Which makes you look nice, too.)

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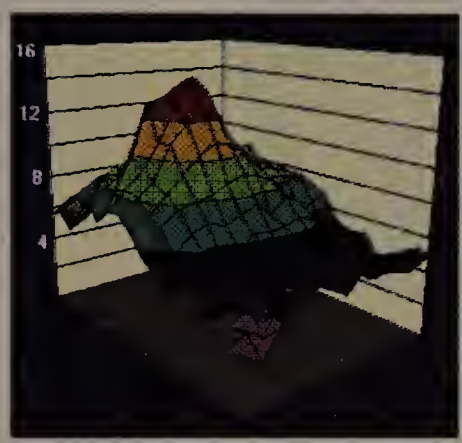

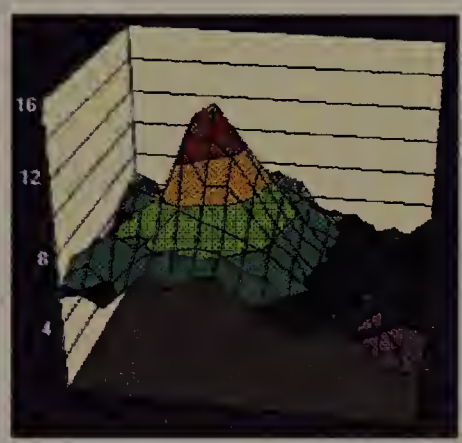

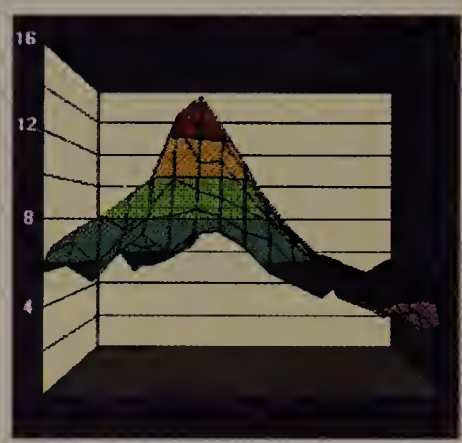

The gallery of 90 chart types includes rotating 3-D charts, along with surface, radar and picture charts. It looks great here. It's even more impressive on your screen.

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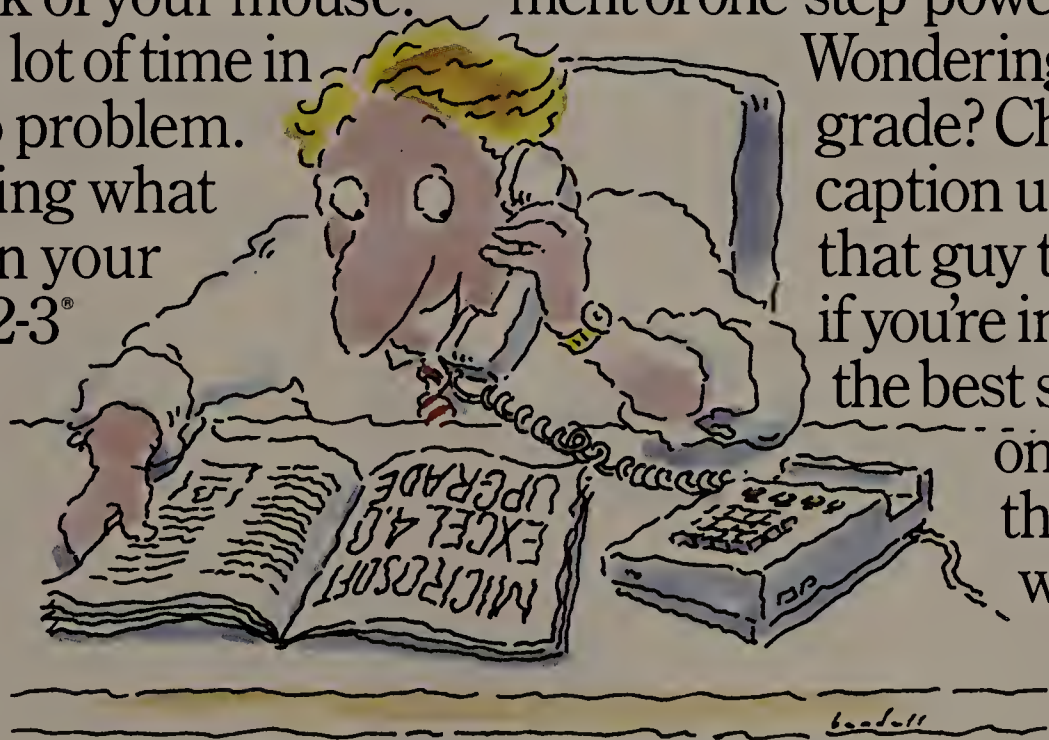

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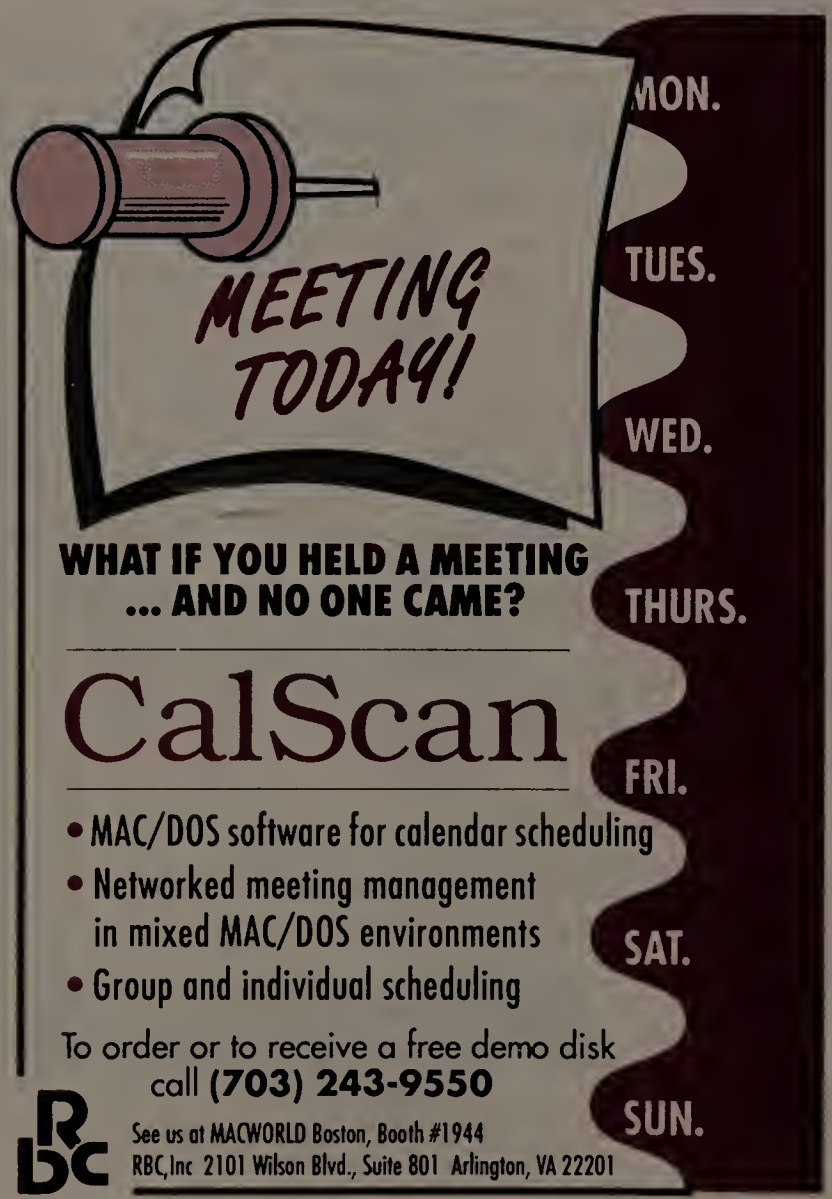

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—Christina Wood

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Christina Wood is an assistant editor for PC World.

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Notebooks With High-Flying Pe

The paths of dashing young scientist Dakota Smith and independent journalist Lexa Kirk, drawn by seemingly mysterious forces, recently converged in South Dakota. There they made amazing discoveries: the Nomad notebooks and the astonishing little HandBook™ from Gateway 2000. Now their s[illegible] mission is to carry the news to the far corners of the world.

"The sky's the limit!" Dakota praises the new Nomads. "These systems are every bit as powerful as their desktop counterparts! I can [illegible] computing on land, at sea or in the air!" The [illegible] patented power-management system delivers [illegible] battery life — over six hours from a [illegible] 25MHz 486DX system. And it has one of the [illegible] brightest notebook screens in the industry.

And Lexa takes off with her HandBook [illegible] a notebook but larger and more [illegible] palmtop — a full PC in [illegible] form! [illegible] a [illegible] new category of portables, and I feel as if this [illegible]

Cow!

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achine were designed especially for me!" she smiles, with her head in the clouds. "The HandBook is so small and feather-light; yet it has a truly usable keyboard and display, a real hard drive, and the capability to transfer files back to my editor. I can travel with it and not even know I'm carrying it!"

"Once again, Gateway is in the pilot's seat," Dakota adds. And, as he and Lexa fly off into the wild blue yonder with their message, we know in our hearts that the saga of Gateway 2000 will continue....

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- Traveling Weight 4.0 Lbs. (HandBook, Battery & AC Adaptor/Charger)
- C & T® Processor, 286-Class Performance
- 1MB RAM upgradeable to 3MB
- 40MB Hard Drive
- Backlit 7.6" Double-Scan CGA Screen, 640 x 400 Resolution
- 1 Parallel/1 Serial Port
- 78-Key Keyboard, 101-Key Emulation, Inverted T Cursor Pad
- MS DOS®5.0, File Transfer Software & Serial Download Cable
- Introductory Bonus Pack
- Carrying Case

$1295

Options: FieldMouse pointing device, 2,400 bps modem, alkaline battery pack, portable printer, combo unit (3.5" drive with serial port and parallel port), extra batteries

NOMAD

- Weight 5.8 Lbs. (Nomad & Battery)
- Dimensions 8.5" x 11" x 1.8"
- 6-Hr.* NiCad 5.7Ah Battery
- 14.4-Oz. AC Adaptor/Charger, 6.12" x 2.25" x 1.5"
- Traveling Weight 6.7 Lbs. (Nomad, Battery & AC Adaptor/Charger)
- Backlit 10" VGA Screen, 640 x 480 Resolution, 64 Gray Scale
- Simultaneous Video
- 1.44MB 3.5" Diskette Drive
- 1 Parallel/1 Serial Port
- External Video & Expansion Bus Ports (Ports are Full Size)
- 79-Key Keyboard, 101-Key Emulation, Inverted T Cursor Pad
- FieldMouse™ Pointing Device
- MS DOS 5.0 & Windows™ 3.1

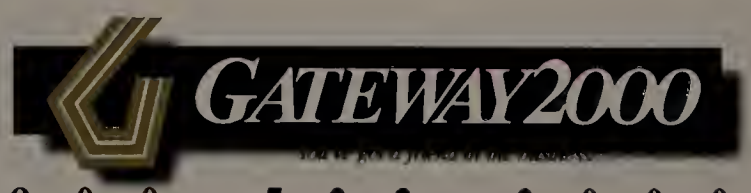
NOMAD 325SXL • $1995
25MHz, 386SXL, 4MB RAM, 80MB Hard Drive

NOMAD 420SXL • $2695
20MHz, Intel® 486SXLP, 4MB RAM, 80MB Hard Drive

NOMAD 425DXL • $3495
25MHz, Intel 486DXLP, 4MB RAM, 120MB Hard Drive

NOMAD Options: 2,400/9,600 bps modems, portable printer, numeric keypad, Token Ring or Ethernet interfaces, SCSI interface, memory upgrades, executive carrying case, extra batteries

**Battery life was measured using* PC Magazine's *Battery Rundown Test with power management enabled. Results may vary.*



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WHAT ? NEXT

By MIKE HOGAN

Garage Sale Today: Three-Legged Chips

MICHAEL LLEWELLYN

Retractions are painful, but here goes. In July you witnessed me getting just a little breathless over the prospect of a then-unreleased 486SX-based multimedia PC from AST that would drive the multimedia dollar premium down into the 300s.

But, a few days before introduction, AST decided that folks would rather have a 386SX/25-based system with a big hardware-software bundle for about the same $900 everyone else is charging. Sorry. Can't blame AST for the announcement miscue. I'm very pushy, and it's a rare company whose product is truly set before my monthly deadline. But a spate of recent 386 introductions from major vendors convinces me there's a cautionary tale that needs spinnin'.

It seems the industry is having a garage sale. You know about garage sales. That's where you push your Total Junk (as opposed to your Still Closet-Worthy Junk) out into the driveway and stare in wonder as muumuu-clad women and men whose T-shirts will never again see their belt buckles pay a quarter here, a buck there, to haul it away for you.

A friend of mine once spent 8 hours selling a three-legged card table for 75 cents at one of these fêtes. Why would anybody want a three-legged card table? And why did my friend, who happens to sell diamonds for a living, take the trouble? I guess the answer to both questions is, because it was there.

Because of the great chip war between Intel and its new competitors, PC makers get 386 chips on the street for $30 to $60 a throw. It's a deal they can't seem to pass up, so you'll soon have 386SX desktops dangled in front of you for $700 or less, 386DXs for under a grand. Don't go for it.

Okay, 386s work for portables—but six months from now, 386 desktops are garage sale fodder. The chip war and the approach of Intel's P5 mean a similar blowout of 486SXs this half. Even in May, 486SX/20 and 486SX/25 CPUs sold for under $80 on the street, not the $213 and $293 on Intel's price list.

By June, you could find a fully packed 486SX for under $1800 from companies like ALR (714/581-6770), ATronics (510/656-8400), CompuAdd (800/627-1967), Magnavox (800/722-6224), and Insight (800/755-9638) to name a few.

To tell the truth, smart money is already focused on 486DXs. Keith Jablon, MIS director for Los Angeles's De Anza Group, switched his 600 users to 486DXs nine months ago. Dean McCarron of InStat reports that industrywide, Intel 486DXs outsold 486SXs 4 to 1 during the first half of the year.

Still, a 486SX can be easily upgraded to 486DX capability and already has the horses for multimedia, *Windows,* and all the other apps that make a 386 wheeze. Unfortunately, I've only found one sub-$2000 multimedia 486 PC, the Educator I by Prominent Computers (800/388-1688). But it's a lot of machine.

And don't let 386-based versions turn you off to multimedia. It's the future, the Great Mandala, the Uroboros—all your favorite analog devices converted to digital and converging at your PC. Everything will be everything. Your phone will be reborn as your PC, your monitor as your TV. Your MTV will be connected to your head bone, and you're going to be able to reach out and snag data over the phone the way *you* want it—voice-mail-turned-text, text-turned-speech, video, graphics. It's a higher level of consciousness, sort of Info at Your Nosetip.

But all these enriched data types are *muy gordo;* they take horsepower, memory, storage. Believe me, you can't get to Great Cosmic Oneness riding a 386. And next year, the muumuus won't give you 50 cents for one.

WHAT TO WATCH

Microsoft goes groupware in July with **Schedule+ for Windows,** a robust scheduler/task planner—the first of many shared apps to rely on **Microsoft Mail 3.0's** messaging infrastructure .... Lexmark debuts its 2½-pound **IBM Portable Printer** in July, a cigarette carton–size thermal-transfer device that prints 25 to 30 360-dpi pages per battery charge for about $385 .... **Microsoft Word for Windows** meets an encyclopedia, a dictionary, a thesaurus, and other references on CD ROM in July for about $425, letting you embed text, graphics, and sound entries in your docs .... For about $175, Caere's **FaxMaster** will add Send Fax to the menus of your favorite **Windows** apps, automatically convert even low-res fax bit maps to editable text, and let you scan in images and text for faxing .... Questions? Contact me at 415/267-1718 or MCI Mail, 329-2648.

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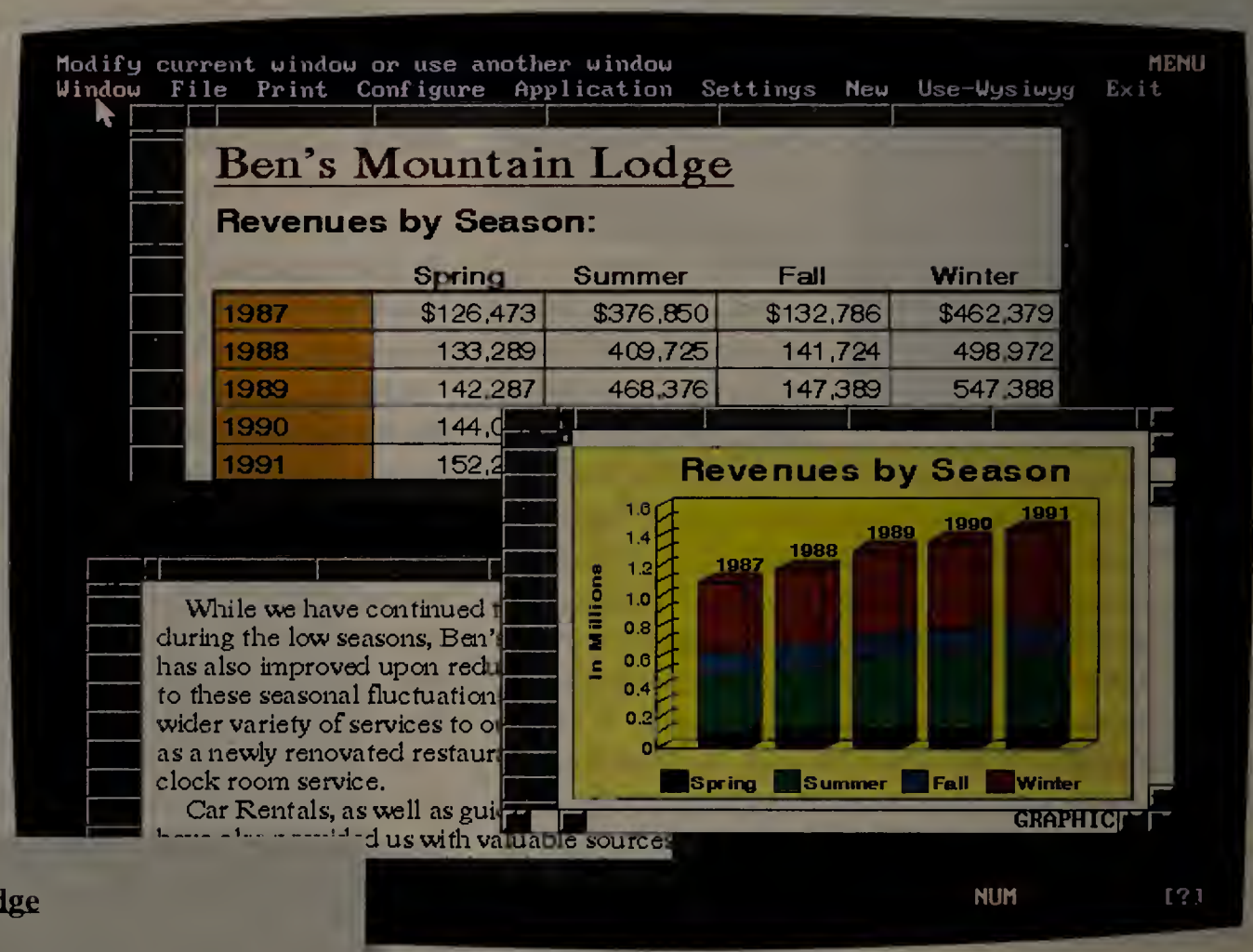


With our new WYSIWYG interface, you can easily create graphs, draw lines and add arrows, shading and color to your letters and reports. ▲

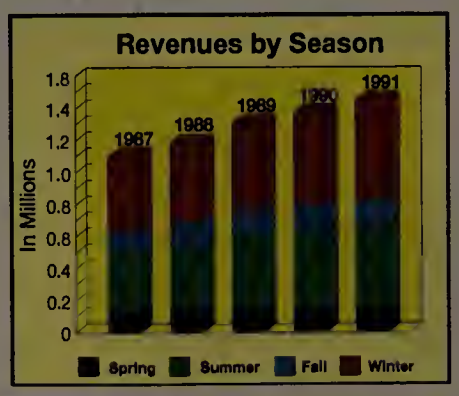
Ben's Mountain Lodge

Revenues by Season:

	Spring	Summer	Fall	Winter
1987	$126,473	$376,850	$132,788	$462,379
1988	133,289	409,725	141,724	498,972
1989	142,287	468,376	147,389	547,388
1990	144,090	498,042	151,234	575,876
1991	152,208	511,398	162,398	621,723
1992	153,947	532,884	164,010	830,242
TOTAL	$852,294	$2,797,075	$899,541	$3,336,580
AVERAGE	142,049	466,179	149,924	556,097

While we have continued to increase revenues during the low seasons, Ben's Mountain Lodge has also improved upon reducing its exposure to these seasonal fluctuations by offering a wider variety of services to our customers, such as a newly renovated gourmet restaurant and around the clock room service.

Car rentals, as well as guided tours of the mountains, have also provided us with valuable sources of revenue, making us much less dependent upon high season sources, such as skiing in the winter, and fishing and hiking during the summer months.



Our estimation is that these new sources of revenue have increased our overall profitability by 24% over the past two years, and that other improvements to lodge facilities have attracted a wider variety of customers than we have seen in the past. Our expectation in the long-term is to see even more profitable years at Ben's Mountain Lodge.

◄ *Our new automatic print compression lets you print any size worksheet on one page.*

Now Symphony comes with full mouse support, so clicking from window to window is a breeze. ►

phonies, this one to be appreciated.

Introducing Symphony Release 3, now with a graphical WYSIWYG environment.

Symphony® from Lotus® has always been the one integrated DOS software package for all your business needs. But now this popular program, which features powerful spreadsheet, database, word processing, communications and graphics environments, is really something to feast your eyes on.

For starters, it features a new WYSIWYG (What-you-see-is-what you-get) interface, so you can easily create graphs, charts, diagrams, lines and arrows. An on-line tutorial and context-sensitive Help also make the program easier to work with.

With the new Symphony, you can switch environments on or off to maximize available memory to build even larger spreadsheets. Plus, you can use our improved file Viewer to quickly preview files before retrieving them. Or to link and combine files on your hard disk to your active worksheet. You'll also find our new Auditor helpful for analyzing and documenting complex worksheet logic.

Since Symphony is such a flexible program, it can easily be customized to meet your specific business needs. And this newest release is compatible with all earlier versions of Symphony and the most recent versions of 1-2-3® for DOS.

To find out more about Symphony, visit your Lotus Authorized Reseller. For a free auto demo or to order your upgrade directly from Lotus, call **1-800-TRADEUP, ext. 6827.***

Symphony Release 3. Sounds good, doesn't it?

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Rocky Mountain Travel
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80203

▲*Take advantage of Symphony's integration by sending out large, personalized mailings that link to the program's database.*

Lotus Symphony

*Please have your credit card and product package ready when you call. In Canada, call **1-800-GO-LOTUS.**

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TOP OF THE NEWS

Edited by RUSSELL GLITMAN

LA Computer Scam Artists Busted

Undercover Police Arrest Trio as They Try to Sell Stolen Computers

Three alleged leaders of a nationwide computer mail-order fraud ring were arrested in late June and charged with attempting to sell $750,000 worth of stolen Macintosh computers.

The arrests follow the May exposé in *PC World* of the trio's involvement in allegedly fraudulent direct sales operations. Tony Ortiz Arce (a.k.a. Anthony Palomino), who ran Los Angeles Component Corporation and Video-Tronics, and Robert Michael Hoover, owner of Integrated Systems (a.k.a. ISC Power Systems), were charged by the Temecula, California, Police Department with possession of stolen property, conspiracy to distribute stolen property, possession of a concealed weapon, and possession of a loaded weapon in a public place. Martin Martinez, one-time owner of One Stop Micro in Van Nuys, California, was arrested at Arce's Video-Tronics headquarters in Signal Hill, California, and was charged with possession of stolen property and conspiracy to distribute stolen property.

Storefront mail-order companies operated by these and other men went out of business early this year after allegedly defrauding customers of hundreds of thousands of dollars.

According to Temecula Sergeant Howard Rush, detectives Paul Brinkman and Chris Antoniadis went undercover and negotiated to pay Arce and Hoover $225,000 for 180 computers worth an estimated $750,000 after receiving a tip the merchandise was for sale. Police are investigating how the stolen merchandise was obtained. —*Mike Hogan*

Compaq's Introductions Rock PC Prices

Compaq's June product blitz of aggressively priced PCs is sending prices tumbling so rapidly that despite years of false alarms, some foresee an impending market shakeout.

"It's really happening this time," asserts Kimball Brown of International Data Corporation. "The consolidation is under way, and there will be a huge fallout." Armed with a near–$750 million war chest, Compaq isn't out for just a share of the under-$2000 PC market, explains Brown. It wants to wipe out as many clones as possible.

Its principal targets, Dell Computer and AST Research, have fired back with their own pricing actions and before summer's end will have revamped their product lines to up the hardware ante. Both preceded Compaq into discount channels, and both are coming off years of impressive revenue and earnings growth. But in the days that followed the introduction of Compaq's Deskpro/M, Deskpro/i, and entry-level ProLinea lines, both companies' stock prices were rocked by market makers who doubt they can outlast or outspend Compaq.

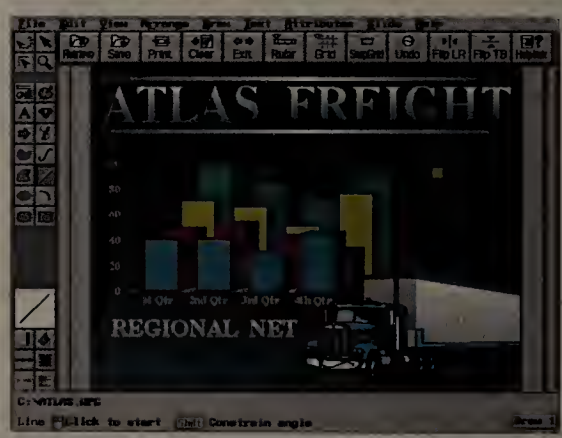
AST's counterattack strategy, says Director of Portable Systems Dan Sheppard, is "to offer more than Compaq for less, all across the line." In AST's case, more includes more slots, more bays, more hard disk, more accessories, and more processor speed for the same price or less.

Meanwhile, Dell has proved it can limbo down even further with a new low-priced Dimension line that complements its current models, which are being upgraded with features and services and repositioned as the Performance series. Starting at $1259 for a 25-MHz 386SX and topping out at about $2400 for a 486DX2/50, the Dimension by Dell line offers more memory, disk, and other features than comparably priced Compaqs.

One weak link in Compaq's strategy: its inexperience in mass merchant distribution, which the cloners pioneered, says Seymour Merrin, publisher of *ChannelMarker*.

—*Mike Hogan*

WordPerfect Draws a New Strategy



DrawPerfect 2.0 is the first of a new breed of multiplatform WordPerfect applications.

WordPerfect has embarked on an ambitious project to allow applications to share information and services across platforms. The first glimpse of the new generation was a beta version of *DrawPerfect 2.0*, shown in June.

Due this fall, *DrawPerfect 2.0* will be followed by the key weapon in the company's strategy, a new version of *WordPerfect Office*—the mail, scheduling, and calendar application. New forms and document management applications and release 6.0 of the flagship *WordPerfect* in both DOS and *Windows* versions will follow.

The products will share a core engine and sport similar graphical interfaces. They will have hooks into all the popular E-mail messaging protocols to link and transfer data. Also under development are document viewers that enable non-*WordPerfect* users to view *WordPerfect* documents without any loss of formatting.

DrawPerfect 2.0 has almost everything you want from a *Windows* application, plus the speed of a DOS program and the ability to run on any PC—it requires just 450K. It includes drawing, charting, and presentation modules, uses pulldown menus, and can open nine screens.

Features include a split-screen capability so you can view and change imported *Excel*, *1-2-3*, and *Quattro Pro* spreadsheets as you use one of the 15 chart types to graph the data. It supports sound, ships with more than 100 MIDI sound clips, and is expected to cost $495. —*Russell Glitman*

Tiny drive: HP's 1.3-inch Kittyhawk is smaller than a matchbox, stores 20MB of data.

Smaller, Versatile Hard Drives Arrive

Many of the hottest products at the November COMDEX Fall show—hand-held computers, 1½- to 2-pound subnotebooks, more versatile printers, and powerful fax machines—will use unique new drives from Hewlett-Packard, Conner Peripherals, and MiniStor Peripherals.

The smallest drive in the world—the 1.3-inch Kittyhawk from Hewlett-Packard—can withstand incredible shocks, up to 100 g's while operating. "You could play Frisbee with them" and they'd still work, says Raymond Freeman, Jr., president of Freeman Associates, a Santa Barbara, California, market analyst.

The size of a matchbox, Kittyhawk holds 20MB, and it weighs less than an ounce. Despite the device's small capacity, HP envisions broad applications for it: Printers might incorporate it as a cache or to provide soft fonts—it fits into font cartridges. In fax machines, removable versions could be used to store incoming and outgoing documents. Future hand-held data collection devices could use the drive with wireless features for periodic downloads.

Conner's Derringer drive is larger in both size (1.8 inches) and capacity (32MB). But it's the first 3-volt–capable drive to conform to the PCMCIA Type III specification, which provides room for two flash cards in a single bay. Bill Klevehsal, director of product marketing at Conner, says the removable IDE drive could operate like a floppy: Workers could use it in their field machines and in their desktops for pull-and-plug data access. "We're working for interchangeability with flash memory," said Klevehsal.

Larger, 64MB, PCMCIA-compatible, removable hard drives will also be available from MiniStor Peripherals Corporation, a San Jose, California, start-up.

Vendors incorporating the drives aren't ready to talk, but a Kittyhawk version of HP's popular 95LX hand-held is a natural, says Jim Porter, president of Disk/Trend, a Mountain View, California, market research firm. Klevehsal confirms that hand-helds and subnotebooks under 2 pounds using the Derringer will be on the market in late 1992.

—Russell Glitman

Microsoft's First Work Group App

Building on the momentum of the July release of *Mail 3.0,* Microsoft plans to unleash a suite of products designed to let large companies combine *Windows* work group applications with their existing network backbone. After unsuccessfully chasing the LAN-based *cc:Mail* market, Microsoft has its sights on Fortune 1000 companies already using large host-based messaging systems. Officials claim the products will allow customers who like the functionality of systems such as PROFS but who want a friendlier interface to standardize on *Windows* and on Microsoft's messaging standard, MAPI.

The applications will share an infrastructure that handles messaging, storage, administration, directory services, and gateways. According to Ronni Marshak, an industry analyst with the Patricia Seybold Group in Boston, the strategy makes sense: "Building on the *Mail* infrastructure is more logical than creating applications that don't have anything to do with each other."

The first product in the suite, released in July, is *Schedule+ for Windows.* It includes tight integration with *Mail* and a slick drag-and-drop interface. While *Schedule+* offers most of the standard amenities of *Windows* group messaging packages, it comes with extras like a miniature project manager that lets you schedule time for projects or automatically selects the best time for a meeting.

The second product in the suite, an E-mail forms routing package, will be out by the end of the year. Work flow, conferencing, and other group application products are also slated.

—Bronwyn Fryer

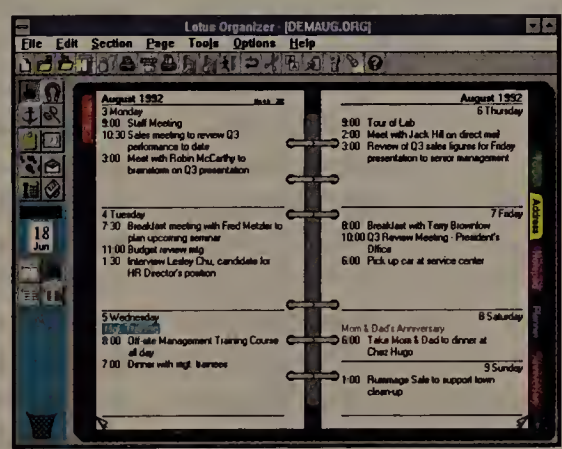
Lotus Launches Organizer PIM

Lotus Development is taking another whack at the personal information manager (PIM) market with *Lotus Organizer,* the first *Windows* PIM from a major vendor.

Concentrating on handling basic daily chores, *Organizer* shows a friendly notebook-style interface with calendar, to-do list, address book, notepad, and planning and anniversary modules. You can easily integrate information between the modules—for instance, link an appointment in the calendar with associated information in the notepad. Like all PIMs, *Organizer* also offers text searching plus plenty of bells and whistles such as the capability to log phone calls or billable time.

Organizer should appear in August at $149, selling on the street for about $100—less than half the cost of most *Windows* rivals. Lotus will sell it direct through an 800 number as well as through dealers. *Organizer* also will be bundled with such portables as Dell's System 320SLi. The product will be the centerpiece of a PIM strategy that extends from palmtops to work groups, says Barbara Baird, senior product marketing manager.

Organizer's interface will help break through the PIM ease-of-use barrier, and Lotus's backing will broaden PIM sales, says David Marshak of Boston's Patricia Seybold Group. *—Eric Bender*



Lotus Organizer is a $100 Windows tool for handling personal information.

Compaq Gets Budget Minded

The high-end giant introduces low-end machines with flair.

by Dan Miller

Though Compaq has traditionally conceded the low end of the PC marketplace to the mail-order guys, it looks like the status quo is changing.

Just months after redesigning and lowering the prices on its Deskpro/M systems, Compaq has introduced three completely new product lines—the midrange Deskpro/i and budget-minded ProLinea desktops, and the Contura series of low-end laptops. The company is also bringing out an aggressively priced active-matrix color version of its LTE Lite 25 notebook and "Windows Edition" Deskpro/M's. The bottom line for buyers: Compaq quality at mail-order prices.

Compaq introduces its new low-end ProLinea and Deskpro/i desktops and the LTE Lite/25C and Contura laptops.

Deskpro/i Series

The Deskpro/i series is targeted at performance-oriented buyers who want both high performance and low prices and might be considering a Dell or an AST. The Deskpro/i series ranges from around $1800 for a 386DX/25 to less than $2400 for a 486DX/33 and give buyers a passel of cutting-edge features in a nice slimline box, for hundreds less than the cost of a comparably configured Deskpro/M.

Cutting-edge feature number one is what Compaq calls Business Audio, which combines an Analog Devices audio chip set, input/output jacks on the back of the box, a sleek microphone, and some extensions to *Windows 3.1*'s sound support. Together, these features enable you to play 16-bit stereo sound from a variety of sources, through headphones or speakers, and to embed sounds in *Windows* apps compliant with Object Linking and Embedding (OLE).

The Deskpro/i's are eminently upgradable thanks to Compaq's VersaChip Upgrade Architecture. All the 386 models come with the BIOS, sockets, and circuitry to support both 386 and 486 configurations; 486 systems leave the 386 section of the motherboard unpopulated. In order to upgrade both 386 and 486 systems, all you have to do is to drop in the new processor and adjust jumper switches to indicate which chip and clock speed you're using. Buyers of 486-based systems have the additional upgrade option of a secondary 64K external cache.

The Deskpro/i systems are available in a small, three-slot/three-bay box; two of the bays are already filled by the floppy and hard drives. Compaq's speedy QVision graphics accelerator handles video chores. Buyers can choose 512K or 1MB of VRAM, which support 16 colors and 256 colors, respectively, at 1024 by 768 noninterlaced resolution.

Compaq is also incorporating much of the new technology from the Deskpro/i's into a new series of "Windows Edition" Deskpro/M's. These special editions will bundle Business Audio hardware, a QVision graphics adapter with 1MB of VRAM, and preinstalled DOS and *Windows* on existing Deskpro/M models, along with a minimum of 4MB RAM and a 120MB hard drive.

ProLinea Line

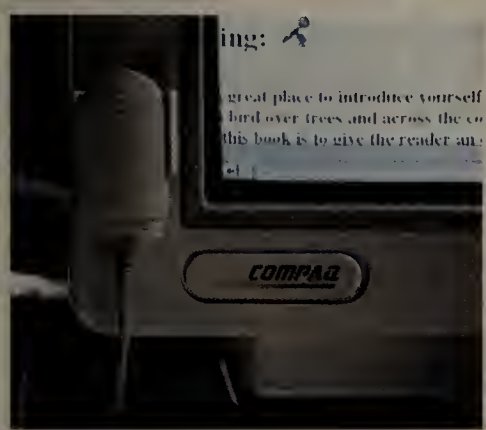
While the Deskpro/i line has that certain indefinable Compaq-ness about it, the new ProLineas represent a departure from Compaq tradition. They were designed in response to two pieces of market intelligence: Half of the PCs sold in the United States last year cost less than $2000, and customers who loyally purchased their servers from Compaq were buying their low-end machines from whoever had the lowest price.

The result: The ProLineas are dirt cheap. Prices start at under $900 for a 386SX/25; a 486/33 is available for under $1800. Overall, these systems are competitive with similarly configured machines from Gateway and Dell.

In exchange for low price, you have to forgo a few of Compaq's traditional design touches. These are the first Compaq systems, for example, to make significant use of third-party components. Video is provided by Western Digital and Tseng Labs chips rather than Compaq's in-house QVision (both chips support 1024 by 768 noninterlaced resolution). Logic chip sets and power sources are also supplied by outside vendors.

Another change: The ProLineas are not particularly expandable. Unlike with the

The trackball on the new LTE Lite/25C notebook is next to the screen.



The Deskpro/i systems come with a bundle of audio hardware.

Deskpro/i's and higher-end Compaqs, you can't upgrade ProLinea processors. Also, the 386 models hold only 512K of RAM, and there's no optional memory cache for any of them. The 386s come in either a two-slot/two-bay configuration or with three of each, while the 486 has a three-slot/three-bay standard configuration.

Bargain Portables

In addition to introducing its brand-new desktop machines, Compaq has added some significant new portables. The most impressive is the LTE Lite/25C, an active-matrix version of its LTE Lite notebook. The 25C's best feature is its sub-$5000 list price, which should translate to about $4000 on the street. In addition to the great price, the machine sports a crisp, bright screen and has a built-in EasyPoint trackball that's a pleasure to use (it's positioned to the lower right of the screen, with the buttons on the back).

Compaq is also introducing the new Contura line of portables. Like the ProLinea desktops, the Conturas are aimed at the low end. They, too, break with Compaq design tradition—where the Lite systems have looked like no-nonsense business machines, white and squared off, the Conturas are more stylish, black and sleekly curved.

The Conturas come in two flavors: a 20-MHz 386SL for under $1700, and the 25-MHz version, for just over $2000—both extremely competitive prices. The 20-MHz unit comes with 2MB of RAM (expandable to 10MB) and a choice of a 40MB or a 84MB hard disk; the 25-MHz model has 4MB of RAM (expandable to 12MB), a 64K memory cache, and a 60MB or 120MB hard drive. Both models are monochrome and weigh in at a little over 6 pounds.

The Contura notebooks are designed to optimize price rather than cutting-edge technology. These new laptops make you give up a few of the features you might expect from a Compaq, such as an expansion chassis, simultaneous LCD-and-external-monitor display, and intelligent power management.

Finally, Compaq is changing the way it deals with customers. Although it's sticking with its established network of authorized dealers and retail outlets for sales, Compaq plans to offer a one-year on-site service contract with every product it sells. Compaq has also set up a fax-back product information service, a CompuServe forum, and an expanded end-user training program.

Compaq also plans an enormous expansion of its distribution channels. The company says it will essentially double its worldwide outlets this year. The company may also develop an increased presence in the low-margin superstores. And while there are no plans to set up a Compaq mail-order division, you may begin seeing the machines in other companies' mail-order ads.

Why the kinder, gentler Compaq? No doubt it all has something to do with the Dells and the Gateways of the world gaining ground with the corporate customers who are Compaq's core clientele. Whatever the reason, Compaq now has a machine to meet every buyer's needs. The question is whether Compaq can stay at the cutting edge of technology, where it made its name, while keeping up with price-cutting by the competition.

Dan Miller is an assistant editor for PC World.

SNAPSHOT

Compaq revamps its entire line.

Deskpro/i desktop systems

■ **Key features:** Business Audio, chip upgradability, QVision graphics adapter with 512K or 1MB VRAM, three slots and three bays
3/25i: 386DX/25, 84MB hard disk (120MB option), 4MB RAM (expandable to 32MB), 16K internal cache $1779
3/33i: 386DX/33, 84MB hard disk (120MB option), 4MB RAM (expandable to 32MB), 16K internal cache $1879
4/25is: 486SX/25, 84MB hard disk (120MB option), 4MB RAM (expandable to 32MB), 8K internal cache with option of 64K external $1879
4/33i: 486DX/33, 120MB hard disk (210MB option), 4MB RAM (expandable ta 32MB), 8K internal cache with option of 64K external $2349

ProLinea desktop systems

■ **Key features:** Low price, third-party components
3/25zs: 386SX/25, 2MB RAM (expandable to 16MB), 40MB hard disk (84MB option), Western Digital video adapter with 512K RAM, two bays and two slots $899
3/25s: 386SX/25, 2MB RAM (expandable to 16MB), 84MB hard disk (120MB option), Western Digital video adapter with 512K RAM, three bays and three slots $1099
4/33: 486DX/33, 4MB RAM (expandable to 16MB), 84MB hard disk (120MB option), Tseng Labs video adapter with 1MB RAM, three bays and three slots $1799

LTE Lite/25C notebook

■ **Key features:** Active-matrix color screen, EasyPoint trackball 386SL/25, 84MB hard disk (120MB option), 4MB RAM (expandable to 20MB), 64K external cache $4999

Contura notebooks

■ **Key features:** Low price
3/20: 386SL/20, 40MB hard disk (84MB option), 2MB RAM (expandable to 10MB) $1699
3/25: 386SL/25, 60MB hard disk (120MB option), 4MB RAM (expandable to 12MB), 64K cache $2099

AVAILABILITY

Immediate

Compaq Computer Corp.
P.O. Box 692000, Houstan, TX 77269-2000; 800/345-1518
Reader service no. 803

Zeos and PC Brand Adopt 486SLC

A new Intel-compatible CPU fits in the 386SX socket and delivers souped-up performance for PC Brand and Zeos systems

Zeos's and PC Brand's 486SLC systems are faster than their 25-MHz 386SX counterparts—but cost nearly the same.

SCOTT PETERSON

by Jeff Bertolucci

What if someone offered you a personal computer that ran nearly as fast as a 33-MHz 386DX—but at a 25-MHz 386SX price? Too good to be true? Maybe not. Thanks to Cyrix's new Cx486SLC microprocessor, you can ride up the power curve without paying a hefty premium.

Despite its name, the 486SLC is not a clone of the 486, but rather a 386/486 hybrid that's compatible with the 486 instruction set. Available in both 20-MHz and 25-MHz clock speeds, the 486SLC uses the same 32-bit internal processing as 386 and 486 chips. Like the 386SX, however, it uses a narrower 16-bit data path to interact with the rest of the system. And where the Intel 486 has an internal 8K RAM cache, the 486SLC's cache is only 1K.

PC Brand Notebook

Among the first vendors to ship a Cyrix-based notebook is PC Brand, Tandon Corporation's direct-market subsidiary, whose new 486/SLC notebook is a slightly modified version of its 386/SX-25 note. But while the 486/SLC offers greatly improved performance and longer battery life, it costs a bare $200 more. Running *PC World*'s application benchmarks, the 486/SLC consistently performed better than 386/SX-25 notebooks. For example, running the CPU-intensive *1-2-3* test, the PC Brand 486/SLC had a 24 percent edge over the average 25-MHz notebook (based on recent tests of 23 of the latest SL and SXL models).

The small, low-voltage (3-volt) 486SLC chip is a natural for notebooks, where powering the CPU uses a large percentage of a battery's juice and where motherboard real estate is at a premium. In informal *PC World* tests, the PC Brand 486/SLC ran about 2 ½ hours with power-management features disabled—respectable for a notebook using a standard nickel-cadmium battery

The 6½-pound 486/SLC has 2MB of RAM (expandable to 16MB), a backlit LCD VGA screen, a 120MB hard drive, and a 3½-inch floppy drive.

Zeos 486SLC-25 Desktop

For $1995—same price as the company's 386SX/25—you get a complete Zeos 486SLC-25 with 4MB of RAM, 107MB hard drive, two floppy drives, and a super-VGA monitor with graphics card.

As with the PC Brand notebook, the Zeos 486SLC motherboard is essentially the same as Zeos's 386SX motherboard, but with slight hardware and BIOS modifications. Perhaps due to the added logic, the Zeos 486SLC-25 ran some 6 percent faster in the *1-2-3* benchmark than PC Brand's 486/SLC, or about 28 percent faster than the average 25-MHz 386SX.

The Crux of Cx486SLC

Overall, our preliminary tests suggest that running at 25 MHz, the Cx486SLC delivers processing performance only 12 to 15 percent shy of a 33-MHz 386DX.

With ever more-powerful, low-cost, high-performance CPUs promised by Cyrix and other firms, expect cheaper systems in the future.

Jeff Bertolucci is an assistant editor for PC World.

SNAPSHOT

PC Brand 486/SLC

Priced $200 more than the 25-MHz 386SX but nearly 25 percent faster.

KEY FEATURES

- **Comparable to a 33-MHz 386DX**
- **Up to 16MB RAM, 120MB hard drive**

AVAILABILITY

Immediate

PRICING

$1995

PC Brand, Inc.
405 Science Dr.
Moorpark, CA 93021
800/722-7263
Reader service no. 823

Zeos 486SLC-25

This low-cost desktop gets a healthy performance boost.

KEY FEATURES

- **Near–33-MHz 386DX performance**
- **4MB RAM, 107MB hard drive**
- **Seven expansion slots, four drive bays**

AVAILABILITY

Immediate

PRICING

$1995

Zeos Int'l Inc.
530 5th Ave. NW
St. Paul, MN 55112
800/423-5891
Reader service no. 824

Ami Pro 3.0 Brings Easy Power

Windows word processing gets friendlier and more powerful with this lively upgrade, which polishes basic writing and printing tasks.

by George Campbell

Ami Pro has always offered a snazzier interface, better graphics handling, and more accurate screen displays than its rival *Windows* word processors. *Ami Pro 2.0* just missed getting a Best Buy in our April roundup, losing a features battle to *Word for Windows 2.0*. Now Lotus has added the missing features and gone Microsoft one better in several areas. The result is a very hot property.

Taking Direct Action

There's a bumper crop of new features. Like *WinWord*, *Ami Pro 3.0* lets you move text with the mouse. You select a block of text, then hold the mouse button down inside the selected area, drag the cursor to a new location, then drop it.

Similarly, formatting also gets a boost with a unique tool that lets you use the mouse to copy formatting from existing text and apply it to other text.

Ami Pro 3.0 offers multiple sets of SmartIcons, each suited to a particular task and completely customizable. Icon buttons let you cycle through the sets; you also can pick one from a list. Unlike *WinWord*, *Ami Pro* lets you edit the icons, change their size, or position them anywhere on screen.

How about that right mouse button? *Ami Pro* uses it for quick formatting jobs. For example, right-click in a paragraph to use the Modify Style dialog box, or click in a frame to see the Frame Layout dialog. Additionally, every dialog box now includes a help button.

A new preview feature lets you see a zoomable thumbnail view of any document or style sheet before loading it. What's more, without leaving the preview, you can search or move around in the document, or print. *Ami Pro* now handles landscape and portrait printing in the same document, too.

You'll also find some powerful new macros in *Ami Pro*'s included set of sample macros. One of the best lets you print a list of documents in batch mode, immediately or at a specified future time.

Masterful Mail Merge

WinWord 2.0's easy mail merge tools bested *Ami Pro 2.0*'s, but *Ami Pro 3.0* is back on top with its intelligent mail-merge feature, which always knows the current stage of the merge. In addition, you can insert merge fields from a list, and an internal flat-file data base system with a friendly card-file front end offers *dBASE III* file support, search tools, and sorting.

Ami Pro 3.0's envelope printing command grabs the address from your letter, then lets you choose an envelope size. You can even store multiple return addresses, picking one at print time. Label printing, also hassle free, employs standard Avery label formats.

Keeping a Clean Screen

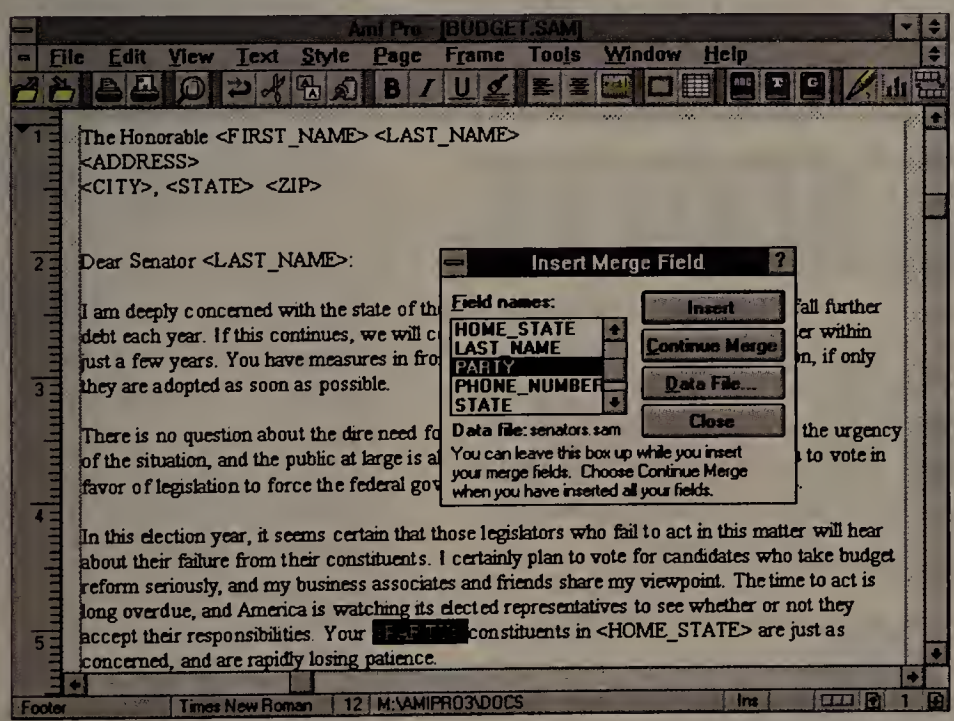
Windows power users will love *Ami Pro*'s unique Clean Screen feature, which can hide any or all of the program's menus, rulers, and icon bars. Keyboard commands still open menus, and it's easy to jump back to the standard display.

Automated style sheets for fill-in-the-blank documents are easier too; you can run a macro just by clicking on a frame. And you'll find file importing capabilities are much improved. *3.0* also includes the complete Houghton Mifflin *CorrecText Grammar Correction System* plus specialized legal, financial, and scientific word lists for its spelling checker.

Lotus claims that *Ami Pro 3.0* will run more than 20 percent faster than its predecessor, which ran head-to-head against *Word for Windows* in our tests. And Adobe's *ATM for Windows* font software still comes bundled.

About the only major omissions are desktop publishing tools: text that flows between frames, and a snap-to layout grid. Otherwise, *Ami Pro 3.0* can handle any word processing or light desktop publishing task with aplomb, and it sets the mark for its competitors.

George Campbell is a contributing editor for PC World.



This built-in mail-merge data base system is typical of the additions to Ami Pro 3.0—it puts the tools you need right where you need them.

SNAPSHOT

Ami Pro 3.0

WINDOWS Ami Pro 3.0 jumps in front of the rest with improved editing and formatting tools, automated style sheets, and intelligent mail merge.

KEY FEATURES

- **Drag-and-drop text moves**
- **Document preview**
- **Grammar checker**
- **Right mouse button formatting support**
- **Clean Screen option**

AVAILABILITY

immediate

PRICING

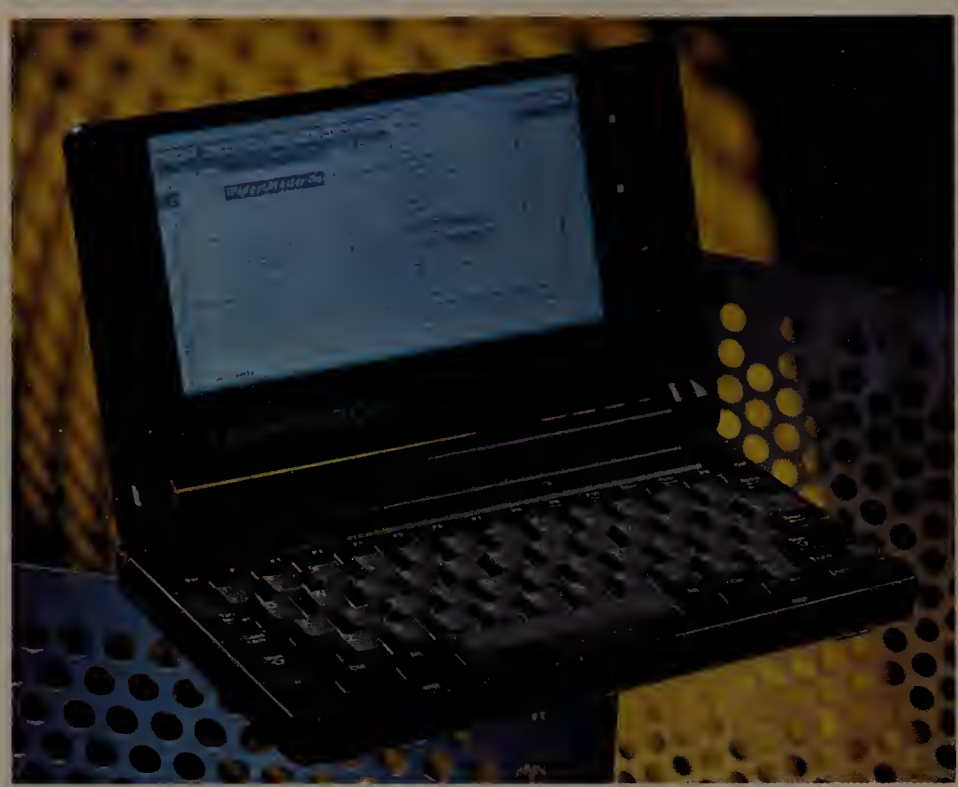
$495; upgrade $129, $49 if Ami Pro 2.0 purchased in last six months, $79 if Ami Pro 2.0 purchased before February 1, 1992

Lotus Development Corp.
Word Processing Division
1000 Abernathy Rd.
Bldg. 400 #1700
Atlanto, GA 30328
800/831-9679,
404/391-0011

Reader service no. 822

Gateway's Pint-Size Portable

The bantamweight HandBook's backlit LCD screen and usable keyboard may make it the optimum traveling companion.



Gateway's HandBook may weigh under 3 pounds, but that doesn't keep this mini-notebook from running your favorite DOS applications at a steady clip.

LUIS DELGADO

by Jeff Bertolucci

I've never understood all the fuss about palmtop PCs such as Hewlett-Packard's 95LX and the Poqet. Sure, equipped with modems or pagers, they're a good way to keep in touch with the office, but their keyboards are too small to type on, and their tiny, dim screens are all but unreadable in anything but optimum lighting conditions. In other words, you can't do any real work on them.

Enter Gateway 2000's new HandBook, a compact, 2.7-pound, 286-based portable with a large enough keyboard and screen to run your favorite DOS word processing, spreadsheet, and data base software. And at $1295, the HandBook costs a good deal less than the 6-pound notes.

Notebook Junior

You'll appreciate the HandBook's space-saving design when you're using the machine on an airplane dinner tray—or even when stuffing it in a briefcase. Manufactured by Sanyo, the HandBook measures 6 inches deep, 9.8 inches long, and 1.4 inches high. (By comparison, Gateway's new Nomad notebooks measure 8.5 inches deep, 11 inches long, and 1.8 inches high, or about 86 cubic inches larger—almost twice the size of the HandBook.) There's still enough room, however, for an internal 40MB hard drive and 1MB of RAM, expandable to 3MB.

The HandBook's 7.6-inch, backlit LCD screen displays surprisingly crisp text and graphics at double-scan CGA (640 by 400) resolution. Gateway claims the internal nickel-metal-hydride battery offers 4 hours of battery life.

Touch typists will like the HandBook's 78-key keyboard. While the 2mm key travel is a bit cramped compared to the standard 3mm travel of most full-size notes, the keys are spaced far enough apart for comfortable word processing. The HandBook uses the customary inverted-T cursor key configuration, but space constraints forced Gateway to emulate <Home>, <Page Up>, <Page Down>, and <End> keys—a shortcoming common among notebook keyboards.

Another space-saving feature: the HandBook is powered by Chips and Technologies' PC/Chip (commonly called PC on a Chip), which integrates a 16-MHz 286-compatible CPU and support chips for controlling video, disk storage, memory, and other tasks. While you can maneuver through DOS applications at a steady clip on this AT equivalent, you're better off leaving *Windows* programs back at the office.

Now the Compromises

You can't take the kitchen-sink approach when designing a 3-pound PC, so it's no surprise that the HandBook lacks a floppy drive. An optional external floppy drive is available, but pricing wasn't set at press time.

The HandBook comes with only two ports: one parallel and one serial. If you bring both a modem and a mouse on the road, you'll have to disconnect one from the serial port to use the other.

Another shortcoming is the absence of a PCMCIA card slot for adding a fax-modem or additional RAM. The carrying case is just large enough for the HandBook itself. You'll have to force the AC adapter in the case—or pack it in your travel bag along with your external modem, phone cord, socks, and underwear.

Gateway president Ted Waitt often says his company isn't out to reinvent the wheel, and the HandBook makes his point: It uses proven technologies in a thoughtful, intelligent way. If you like to travel light, don't need high-quality graphics, and do lots of word processing, take the HandBook rather than a standard note the next time the road rises up to meet you.

Jeff Bertolucci is an assistant editor for PC World.

SNAPSHOT

Gateway 2000 HandBook

This mini-notebook's backlit screen and internal hard drive make it a worthy choice for portable computing.

KEY FEATURES

- **2.7 pounds with battery, 3.5 pounds with AC charger**
- **Chips and Technologies' space-saving PC/Chip for 286-class performance**
- **78-key keyboard with 2mm key travel and inverted-T cursor pad**
- **7.6-inch, backlit LCD screen offers double-scan CGA (640 by 400) resolution**

AVAILABILITY

Late summer

PRICING

$1295; pricing not set at press time on external floppy drive, external modem, or other options

Gateway 2000 Inc.
610 Gateway Dr.
North Sioux City, SD 57049
800/523-2000,
605/232-2023 (fax)
Reader service no. 731

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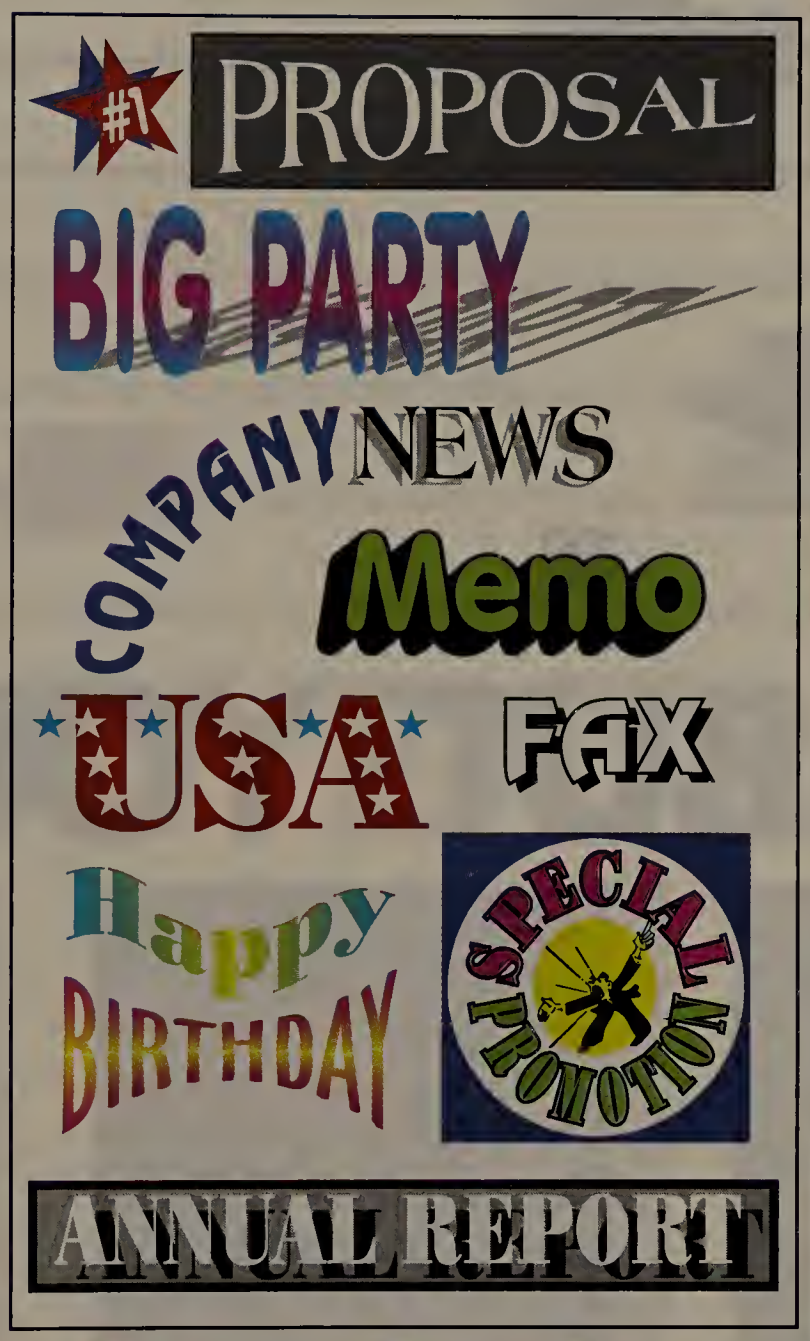

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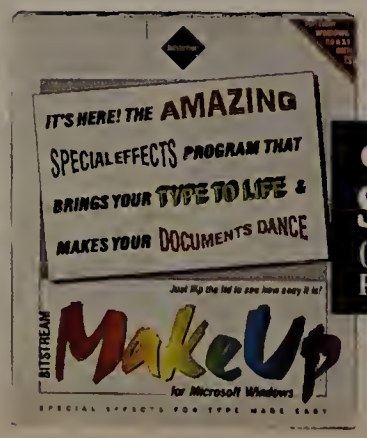

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- 1.2mb 5.25" / 1.44mb 3.5" floppy drives.
- Non-Interlaced Super VGA color monitor, 1024x768 resolution.
- 16 bit SVGA card with 1mb Ram.
- Compact Desktop Case with 7 Drive Bays.
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- 16 bit SVGA card with 1mb Ram.
- Non-Interlaced Super VGA color monitor, 1024x768 resolution.
- Compact Desktop Case with 7 Drive Bays and Dual Fans.
- 200 watt power supply.
- Clock calendar, parallel port and two serial ports.
- 101 key keyboard.
- 6 expansion slots, 2 occupied.
- MS-DOS 5.0
- Microsoft Windows 3.1 & Mouse

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- Compact Desktop Case with 7 Drive Bays and Dual Fans.
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Optical Drives Reach a Pinnacle

The PMO-650 is the first rewritable optical drive we've ever tested that can get out and run neck and neck with hard disks.

The Pinnacle PMO-650, shown here in a handsome external unit, offers removable 560MB disks and blazing speed.

by Rex Farrance

Rewritable magneto-optical drives have always had one great pitch—the capability to store huge amounts of data on removable, relatively inexpensive disks. What they can't supply is the fastball. They're only about half as fast as Winchester hard disks, so magnetic storage can still generally drive 'em out of the park when it comes to day-to-day work in standard business applications.

But Pinnacle's PMO-650 changes that. This new 5¼-inch drive is a speedy new addition to the optical lineup. Not only does it give you up to 560MB of usable storage per disk, it's by far the fastest optical drive we've ever tested—so fast it can challenge hard drives on their own playing field.

Meeting the Need for Speed

We put the PMO-650 to the test against a very fast full-height 16ms Micropolis Model 1588 SCSI drive with a 640MB data capacity. Pinnacle offers you a choice between Adaptec and Future Domain SCSI adapters; we tested with the Adaptec. We ran our standard suite of optical benchmarks plus a multimedia test, an attribute-resetting test, file deletions, and a data base test.

When we completed our benchmarks, we were blown away. In tests designed to evaluate typical use, the two drives came out dead even overall. Pinnacle held a 30 percent speed edge on the data base and attributes tests, while the Micropolis deleted 3000 files 43 percent faster and outperformed the Pinnacle almost 3-to-1 in the less common task of copying a 30MB file.

How does Pinnacle get around the bases so fast? The Pinnacle PMO-650's design employs a faster-than-usual 3600-RPM rotation, a new ultralight optic head, direct seeks (avoiding the two-step data access common to most optical drives), and a data queuing scheme for reads and writes that gives some of the benefits of the caching used on magnetic drives.

Pinnacle also packages the PMO-650 nicely. You can buy a full-height internal drive or a handsome external unit that can be laid flat or placed on its side. And a clever dust-protection scheme seals the door after you insert the media and even pulls the disk inside if you leave it partially ejected for over 30 seconds.

Is the Price Right?

So what might prevent you from buying this fleet-footed beauty instead of a hard disk? Price.

The Pinnacle internal drive lists at a hefty $4294 with an adapter and a single disk, but you'll probably find it on the street for under $3500. The Micropolis, on the other hand, costs approximately $2500 if you factor in a third-party SCSI kit, and you can expect a street price of under $2000. At about $6 per megabyte, the PMO-650 costs almost twice as much per megabyte as the Micropolis.

But the situation turns around if you buy a second and third disk and expand the PMO-650's extended capacity to 1120MB or 1680MB: cost per megabyte drops dramatically to a little over $3 and $2 respectively. (Remember that only 280MB of storage is immediately available; you must power down and flip the disk to access the other 280MB.)

The bottom line? The PMO-650 has the raw speed to challenge a magnetic hard disk. But with its high price, it makes the most sense in the traditional roles of optical drives—to lock up data each night, juggle giant graphics files, or just to handle vast amounts of data. If you're playing in this ballpark, the PMO-650's pitch is right on the inside corner.

Rex Farrance is an assistant editor at PC World.

SNAPSHOT

Pinnacle PMO-650

This rewritable optical drive is easily the fastest we've ever tested, although it's still far more pricey than a comparable hard drive.

KEY FEATURES

- **Performance competitive with fast hard drives**
- **Removable 560MB dual-sided disks**
- **Dust protection**

AVAILABILITY

Immediate

PRICING

Internal version with adapter and one disk $4294, external version with adapter and disk $4394; media $199

Pinnacle Micro Inc.
19 Technology Dr.
Irvine, CA 92718
800/553-7070
Reader service no. 802

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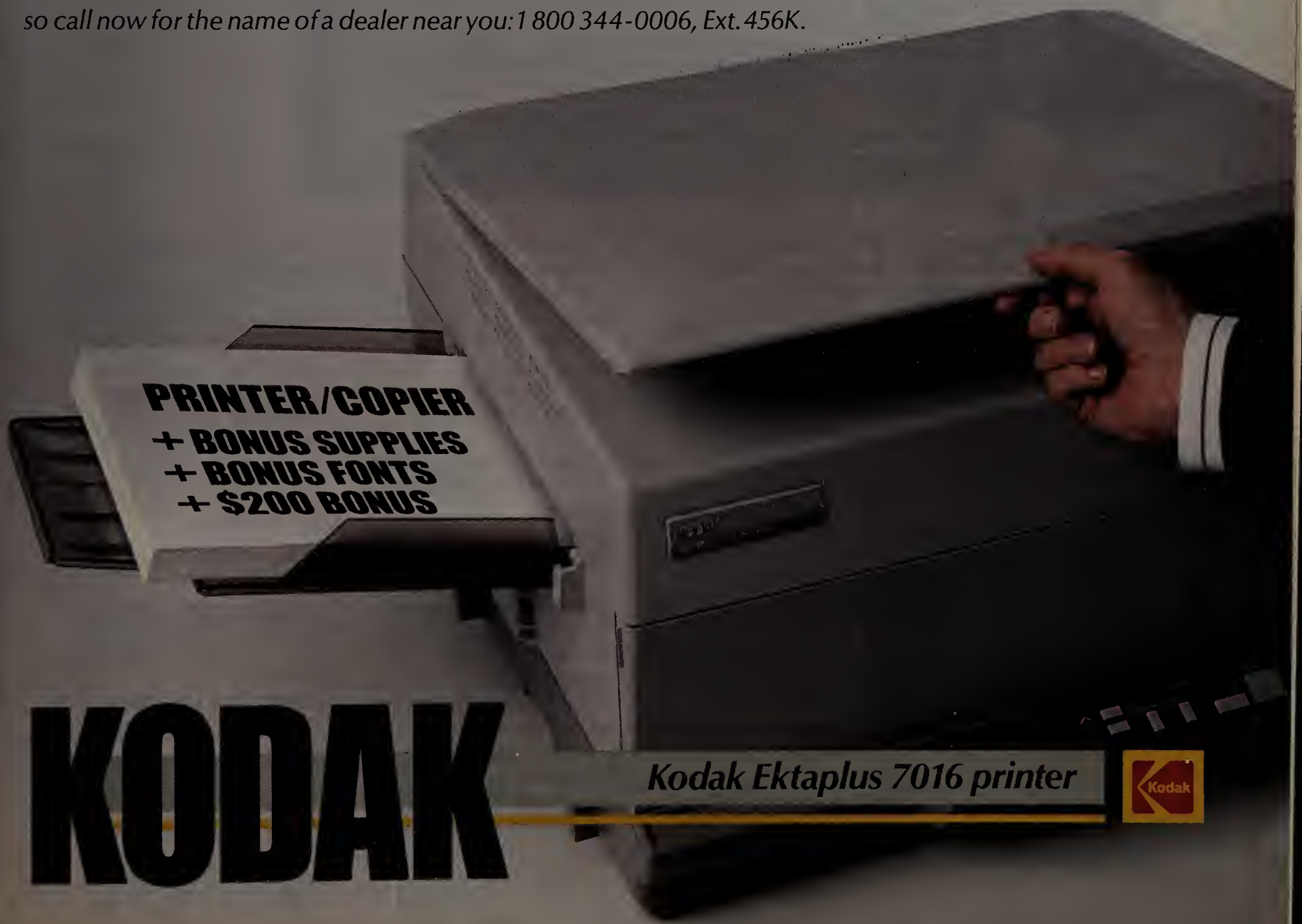
Just for the summer of '92, the Ektaplus 7016 printer comes with an impressive list of bonuses, including a deck of font cards, and supplies—toner and a photoconductor kit—that should last you a year. And, just in case you need an extra incentive to buy now, we'll throw in a $200 cash rebate. This offer ends August 31, so call now for the name of a dealer near you: 1 800 344-0006, Ext. 456K.



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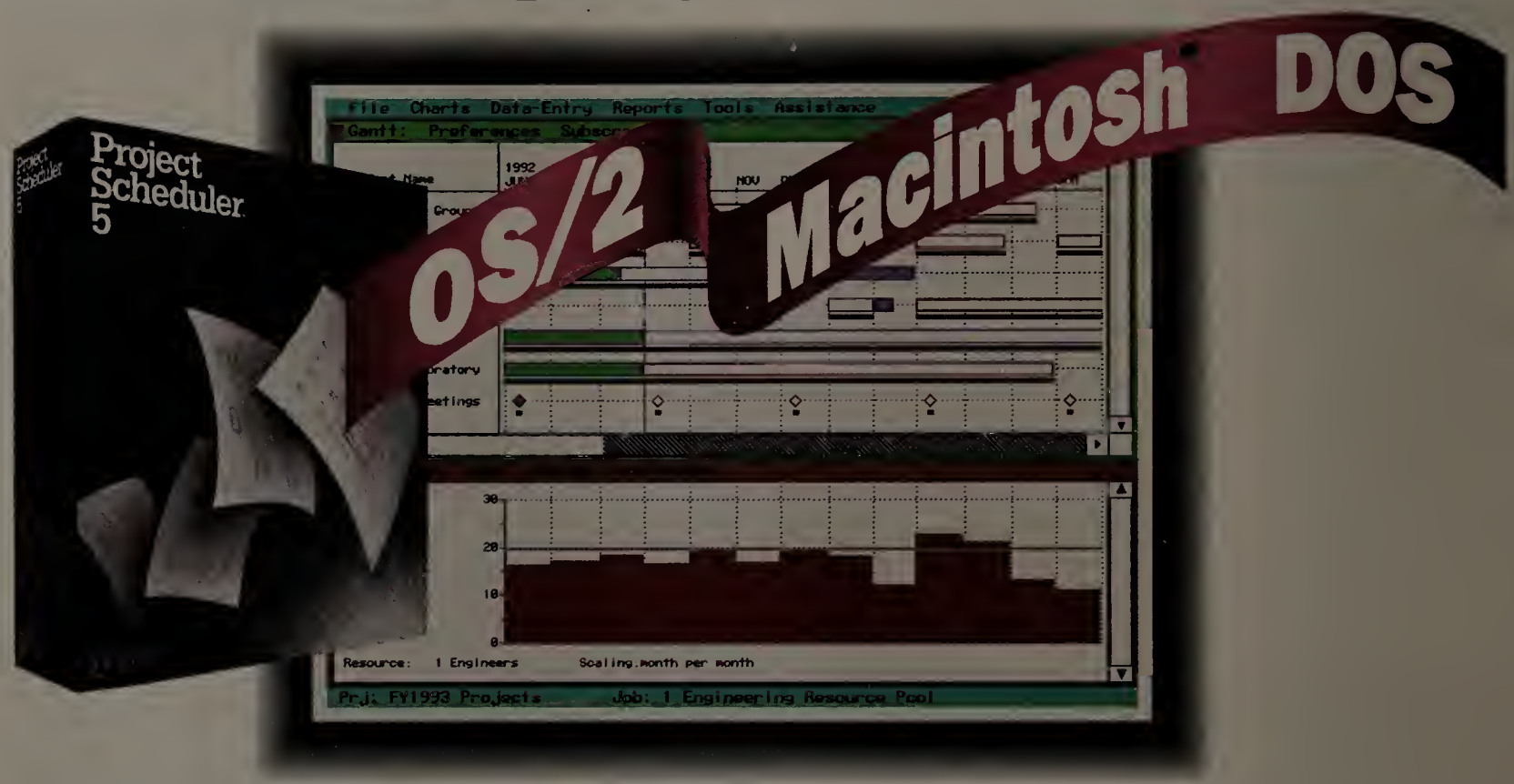

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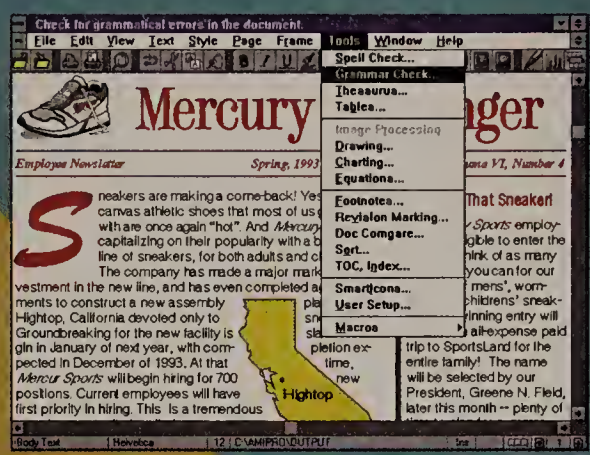

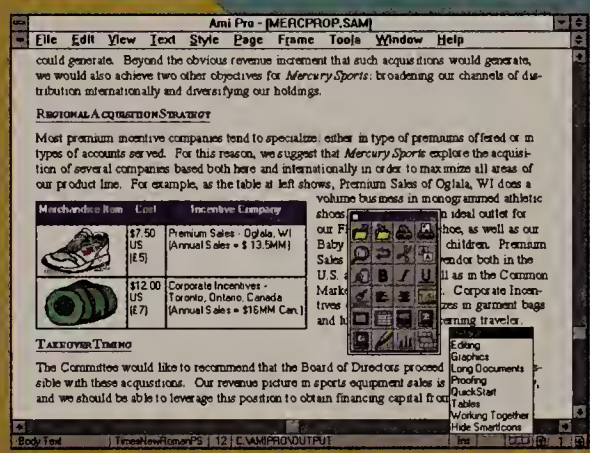

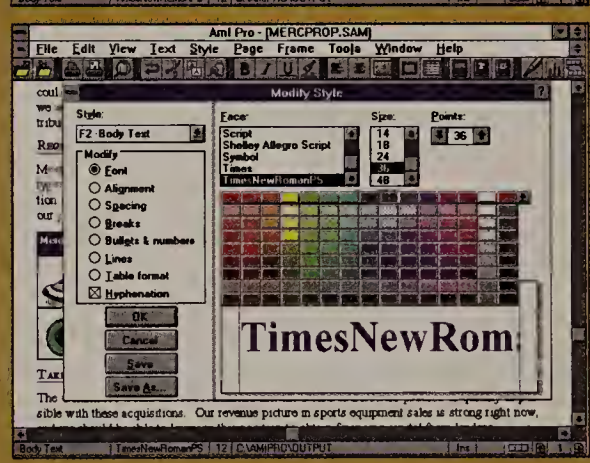

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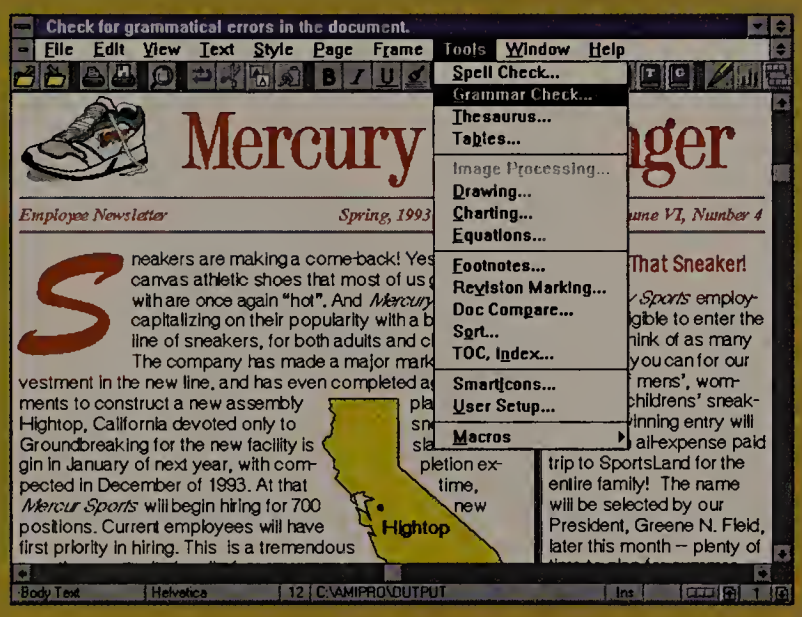

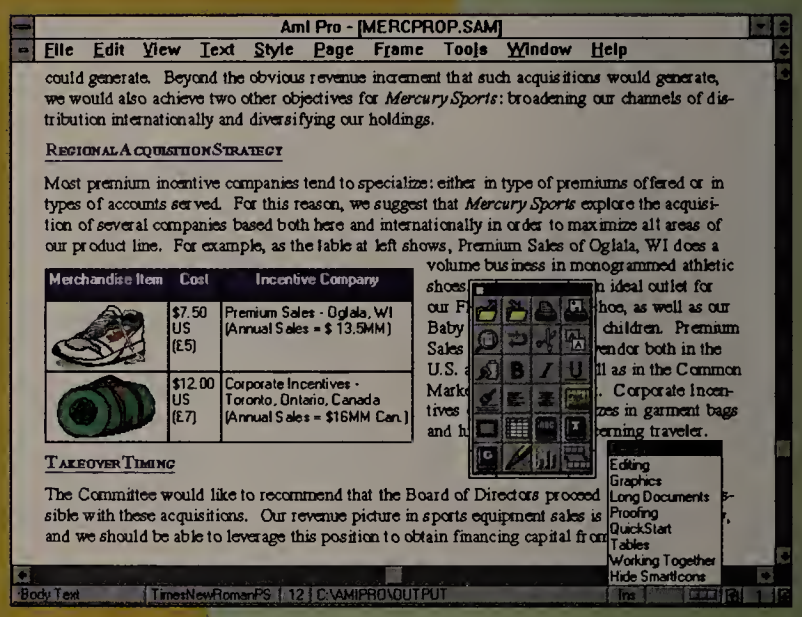

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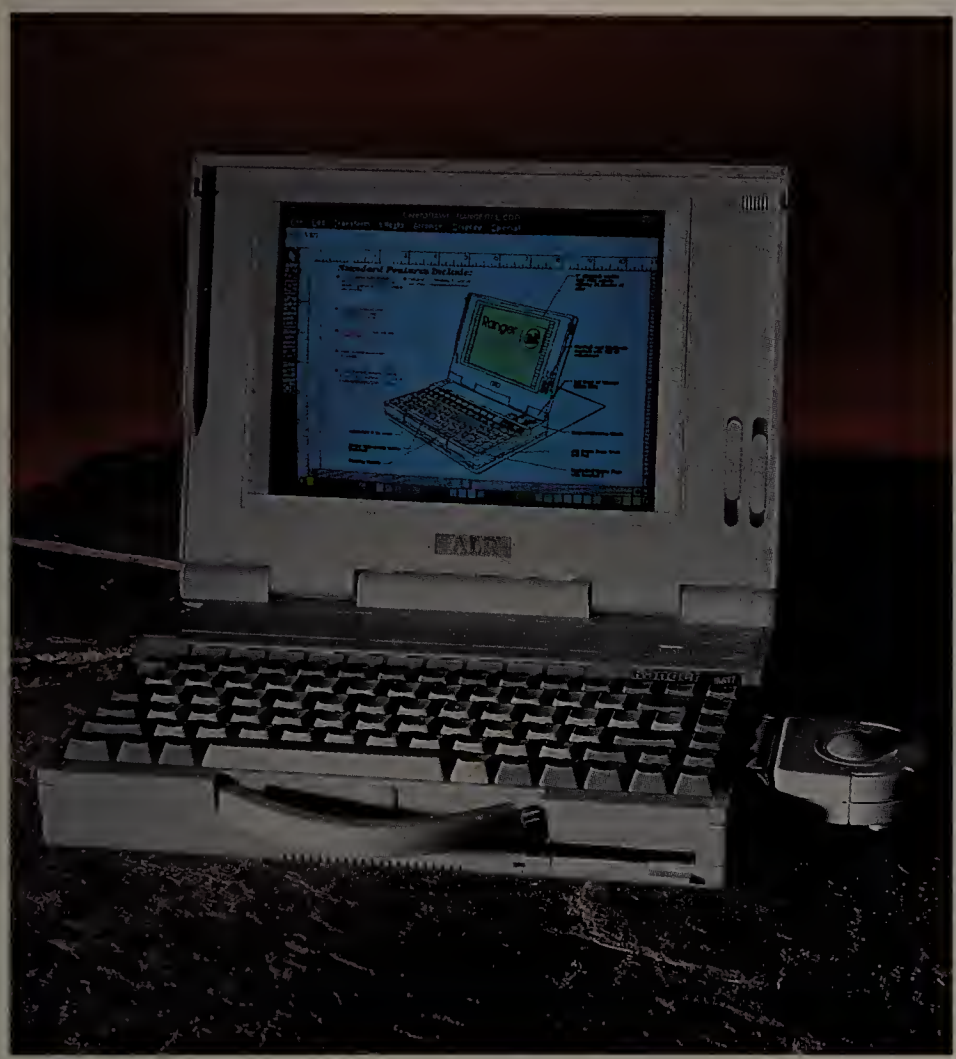
See Other Side for Details.

Edited by RUSSELL GLITMAN

ALR, Altima: A Tale of Two Notes

These modular notebooks are based on 486SX and 486DX CPUs but offer different upgrade paths, pricing, and performance.



Upgrading the ALR Ranger's processor is a simple task: Remove two screws, lift a small panel, and swap the credit card–size CPU modules. The nickel-hydride battery supplies up to 5 hours of continuous power, ALR claims.

Technology trickles down from servers to desktop PCs to portables to notebooks. *Modularity*—a buzzword that generally means an easy CPU upgrade path—is no exception. The m-word has been an essential "checklist item" for desktop systems for at least a year now—even though vendors report that the option isn't always exercised.

Notebooks are following suit: ALR and Altima, two major manufacturers of lightweight, battery-powered machines, have announced upgradable lines. Both of these top-of-the-line manufacturers have elected to start their modular lines with a 20-MHz 486SX system, and both let you trade up to a 25-MHz 486SX. But while ALR's top step is a 25-MHz 486DX, with Altima you can move up another rung to a 33-MHz 486DX.

There are other differences between ALR's Ranger line and Altima's 420/425/433 units—not the least of which is price. The Altimas are considerably less expensive: Configured with 4MB of RAM and an 80MB hard disk, Altima's 486SX/20 comes in at $2999—almost $600 less than the comparable ALR unit, which costs $3595. At the 25-MHz level the price difference is even greater: Altima's 425 model lists for $3199, almost $700 less than the $3895 for ALR's Ranger M4SX/25 Model 80. Step onto the top level and you can purchase Altima's $3499 33-MHz 120MB 486DX for $700 less than ALR's slower $4199 25-MHz 120MB 486DX model.

The difference between the systems will likely carry over to the upgrade modules. ALR's SX/25 upgrade costs $695, and its DX/25 upgrade will set you back $995. ALR will give you $100 when you trade in your old processor module; Altima charges $599 to upgrade from the 20-MHz to the 33-MHz version and $399 to step up from the 25-MHz version to the 33-MHz one. The price includes the trade-in of your old chip.

The Altima 5.7-pound base unit is nearly 2 pounds lighter than ALR's 7.5-pound system, boasts 2 more keys (84 as opposed to 82), and has a slightly larger screen (10 inches as opposed to 9). It also has a slightly higher RAM capacity—20MB instead of ALR's 16MB—though both systems come with 4MB of RAM.

However, some kudos go to ALR, in particular the ease-of-upgrade award. ALR's engineers designed the processor upgrade to be so easy that any user can do it: Simply remove two screws, lift off a small panel, and swap the credit card–size CPU modules. The entire process shouldn't take longer than 2 minutes. Altima requires the user to return the unit to a service depot or the vendor for the swap-up.

ALR also scores points for its long-lasting battery. Thanks to its nickel-hydride battery, ALR claims its machine gives up to 5 hours of continuous service; Altima officials say their nickel-cadmium battery will run down after about 2½ hours.

—*Michael Goodwin*

IN BRIEF

ALR Ranger M4SX/20, M4SX/25, M4DX/25 lines

Three models offer a choice of CPUs—486SX/20, 486-SX/25, and 486DX/25—in a tidy 7.5-pound package.

Advanced Logic Research, Inc.
9401 Jeronimo
Irvine, CA 92718
800/444-4257,
714/458-0532 (fax)
Reader service no. 603

Altima 420, 425, 433

One 5.7-pound system unit houses your choice of processors: 486SX/20, 486SX/25, and full-tilt 486DX/33.

Altima Systems, Inc.
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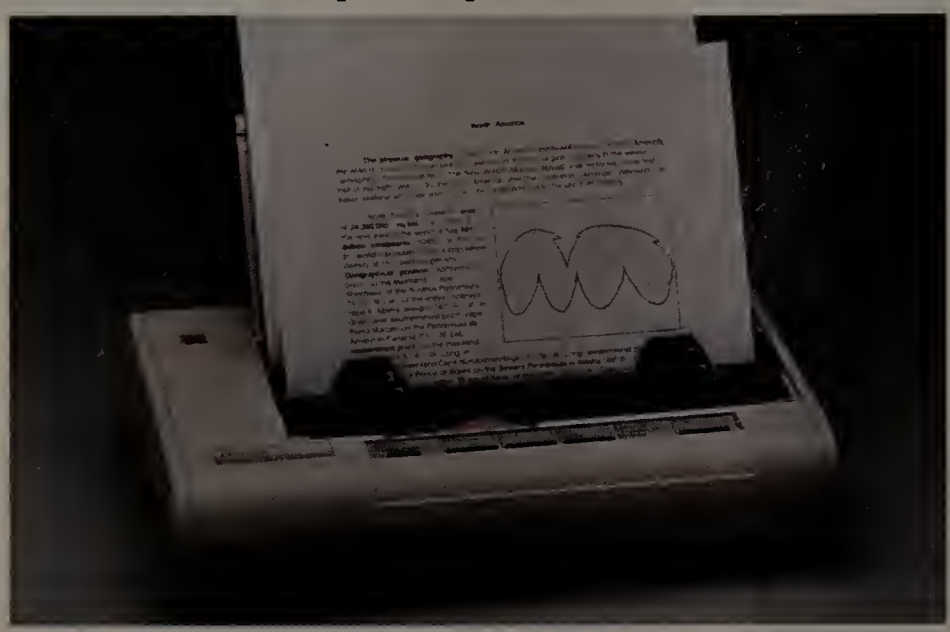
#1050
Concord, CA 94517
800/356-9990,
510/356-2408 (fax)
Reader service no. 604

Office-Quality Output to Go or in the Office



Kodak's portable Diconix 701 ink jet offers office-quality 300-dpi output.

Kodak's $549 Diconix 701 printer feels at home on the road or on your desktop. At 2.4 by 7.4 by 11.7 inches, the Diconix 701's footprint is about the size of a ream of paper. The 5.9-pound ink jet is a little heftier than its closest competitor, the Canon BJ-10ex (or for that matter, Kodak's own Diconix 180si), but it's still light enough to slip comfortably into your briefcase.

Unlike most mobile printers, the Diconix offers office-quality 300-dpi text and graphics at a reasonable speed. Kodak claims print speeds of 3 ppm in draft mode and 2 ppm for higher-quality documents.

The Diconix 701 comes with a handful of fonts in sizes from 10 to 20 characters per inch: Courier, Gothic, and a Helvetica knockoff in bold, italic, underlined, and shaded styles. You can use 20K of its 23K RAM buffer for storing downloaded fonts; the printer will also print in landscape mode.

Unlike the BJ-10ex, the 701 has a built-in paper feeder that holds 30 cut sheets of letter- or legal-size paper or transparencies. However, the Diconix can't print envelopes or individual labels. The printer hooks to your PC via its lone parallel port and emulates HP's DeskJet Plus and IBM's Proprinter X24E, guaranteeing broad application support.

You can run the 701 via AC or battery. The $50 nickel-cadmium battery is good for about 100 pages between recharges. Kodak offers a one-year warranty for parts and labor. A carrying case costs $60.

—Daniel Tynan

IN BRIEF

Kodak Diconix 701

This $549 printer produces output good enough for the office in a package small enough for the road.

Eastman Kodak
901 Elmgrove Rd.
Rochester, NY 14650
800/344-0006
Reader service no. 605

IBM Printer Delivers PostScript for the People

PostScript isn't just for desktop publishers anymore. With its scalable fonts and superior graphics, a PostScript printer can make almost anybody look good on paper—a big reason why many offices are adopting the Adobe standard. Now IBM spin-off Lexmark Int'l has two PostScript printers that can handle the demands of busy offices.

The $2295 LaserPrinter 6P features a 6-ppm engine with a standard 10-MHz 68000 processor and 17 scalable Adobe Type 1 fonts. The 6P's 2MB of RAM is expandable to a generous 9MB. The compact, 33.6-pound machine is 12 by 14 by 21 inches and has a duty cycle of 14,000 pages a month, ideal for small work groups.

The 6P employs Lexmark's own resolution enhancement for sharper output—or you can upgrade to true 600-by-600-dpi resolution by installing a $799 4MB RAM module.

The $3795 10P features the same footprint as its 6P sibling but with the greater speed, fonts, and paper handling a larger office requires. The 10-ppm unit is powered by a 16-MHz 68020 processor and comes with 39 Adobe fonts. With its 5MB of RAM, you can print at 300 or 600 dpi, though the higher resolution slows performance. Designed to crank out 20,000 pages a month, this workhorse comes with a 250-sheet output bin that shuts down the printer when full, preventing overflow.

In addition to PostScript and their native PPDS page description language, both printers can emulate a LaserJet Series II and an HP-GL–based plotter. LaserJet III (PCL 5) emulation costs another $199. A 200-sheet input tray is standard, and you can add a 500-sheet feeder for $449. Both machines come with a one-year warranty. *—Daniel Tynan*

IN BRIEF

IBM LaserPrinter 6P, IBM LaserPrinter 10P

High-resolution PostScript printers for work groups large and small.

Lexmark Int'l
740 New Circle Rd. NW
Lexington, KY 40511
800/358-5835
Reader service no. 606

Lexmark's work group–worthy LaserPrinter 10P churns out PostScript documents at 600 dpi.

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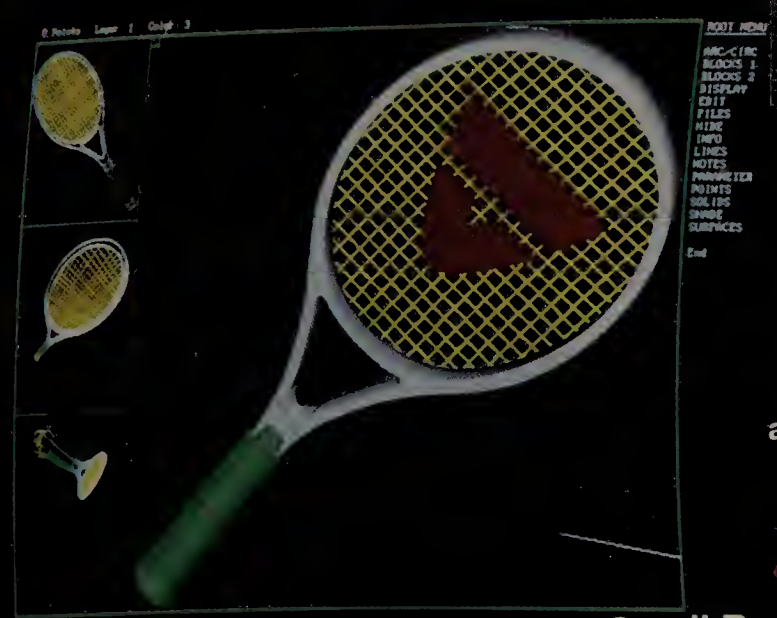

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PC Brand Offers Power Without a Premium

If rock-bottom prices for high-performance PCs keep catching your eye, only to bust your budget once you've added in the cost of a monitor, hard drive, and the memory you need to run *Windows*, then take a look at PC Brand. This direct arm of Tandon Computers is an alternative that gives you everything you want, including a low price.

Most buyers looking for a fully loaded, power user's machine won't have to add much to the $1495 price tag of PC Brand's new Leader Series 386/40 Cache. The 40-MHz 386DX system includes a 64K cache, 4MB of RAM (expandable to 32MB), a 105MB IDE hard drive, and a 16-bit super-VGA graphics card and monitor. The machine also comes with a 1.44MB 3½-inch floppy drive and a 1.2MB 5¼-inch floppy drive, includes a serial mouse along with its 101-key enhanced keyboard, and comes bundled with *Windows 3.1* as well as DOS 5.0. PC Brand also offers the 386/40 with a 170MB hard drive for $1645, with a 200MB drive for $1745, and with a 400MB drive for $2145.

The $1495 Leader Series 386/40 Cache from PC Brand includes a 64K cache, 4MB of RAM, and a 105MB IDE hard drive.

If a 40-MHz 386 isn't powerful enough, PC Brand has a 33-MHz 486DX model, similarly configured, for only $400 more. The 486/33 Cache comes with the same hard drive options as its 386 stablemate: 105MB for $1895, 170MB for $2045, 200MB for $2145, and 400MB for $2545. Both have one 8-bit and four 16-bit expansion slots and two 5¼-inch and two 3½-inch drive bays.

PC Brand introduced the Leader Series last spring. By the time you read this, prices may be lower still. They now cost about 25 percent less than the company's Upgradable Series PCs, with upgradable CPU modules.

Both systems come with unlimited toll-free telephone support; a 30-day, "no questions asked" money-back guarantee; and one year of free on-site service. —*Rob Garretson*

IN BRIEF

PC Brand Leader Series 386/40 Cache, 486/33 Cache

Two souped-up, fully loaded PCs at rock-bottom prices.

PC Brand Inc.
405 Science Dr.
Moorpark, CA 93021
800/722-7263,
800/722-7392 (fax)
Reader service no. 608

Cache In on Better Performance

If you work mainly with an application that makes continual calls on your hard disk—such as a data base program or *Windows'* virtual memory—your standard hard disk controller may be slowing you down, even if you have a fast 486 processor. Caching controllers can minimize disk reads, measurably improving performance for many applications. The price of these high-performance peripherals can be more than balanced by big savings in working time. With that in mind, SCSI hard disk users will want to check out DPT's latest SmartCache Plus controller, and IDE users will be interested in Intelisys's new DC-600.

DPT, the first vendor to offer a PC caching controller, is now shipping its SCSI Performance Package with the SmartCache Plus controller. You can purchase the SmartCache Plus in a cacheless configuration and expand to as much as 16MB of cache for use on big file servers and multiuser systems. The Performance Package puts a number of small commands together and executes them all at once—vastly improving SCSI performance on small operations. In addition, the SmartCache automatically reads more of the disk than was requested, moving that data to cache RAM. This can pay big dividends when you load large applications and files. List prices start at $595 for the DPT SmartCache Plus ISA and $785 for the EISA model with no cache. Adding 4MB of cache costs $595.

The Intelisys DC-600 ISA controller is aimed at IDE users and is designed with an eye to the future, supporting up to four IDE drives of 4GB each. The controller automatically recognizes drive configurations, supports up to two additional floppy drives, and is available with standard SIMM caches up to 16MB. The Intelisys controller queues commands and uses a variety of caching algorithms to break up the I/O bottleneck, including deferred writes and a special write-back scheme that allows the controller to use multiple drives at full efficiency. The DC-600 costs $395 in its base configuration with 256K of RAM.

—*Rex Farrance*

IN BRIEF

SmartCache Plus, DC-600

Two caching controllers.

DPT
140 Candace Dr.
Maitland, FL 32751
407/830-5522,
407/260-5366 (fax)
Reader service no. 609

Intelisys
12015 Lee Jackson Hwy.
#130
Fairfax, VA 22033-3300
703/385-0347,
703/385-9134 (fax)
Reader service no. 610

My Dearest Ellen,

If there is anything better than being loved by you...it is loving you.

And you are so easy to love. You've brought such wonder into my life and have touched my heart with your love.

I just want you to know, my darling, that it feels so good being in love with you and I want to love you for a very long time.

You are a wonderful woman and I love you dearly. If I'm dreaming, please don't wake me up--I don't want this to end.

Yours monogamously,

F1 - Help! F8 - Options

To: Chris Keenan
From: Scott Anderson
Subject: Career-Limiting Remarks
Date: 10/07/91

During a recent dinner at Chairman Binkelheimer's home, you stated that members of the Daughters of the American Revolution are "a bunch of old battle-axes."

Judging from the fact that you made this comment within earshot of the Chairman, you must not be aware that Mrs. B. is a founding member of the local D.A.R. chapter and holds rank of Brigadier General.

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Anthony Halstein

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PERFORMANCE OF

INTRA-OFFICE REL

CHARACTER ISSUE

OTHER COMMENTS:

RECOMMENDATIONS:

Pg 1 Sec 1 1/1

Microsoft Word - RESUME.DOC

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RESUME

I got a new job,
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Circle 71 on reader service card

Apple Tries a Bite of the PC Scanner Market

The Apple OneScanner for the Mac owes much of its success to *Ofoto*, a savvy one-step image-scanning software package developed by Light Source in conjunction with Apple. The Apple OneScanner for Windows ($1299) is the same scanner with *Ofoto 1.0* in *Windows* dressing.

The 300-dpi OneScanner measures just under 22 inches long and 13 inches wide. An 8-bit flatbed scanner capable of capturing up to 256 shades of gray, the OneScanner is primarily intended for imaging, so the first step you need to take to ensure a good quick scan and optimum output is to calibrate your output device with the OneScanner. Like everything else about the OneScanner, the process is simple. Open *Ofoto*, select Create Gray Chart from the Calibrate menu, print out the Gray Chart, and scan it. *Ofoto* then goes through seven steps to create a new calibration for that output device.

Scanning an image can't get much more automated than this. Raise the OneScanner lid, toss a picture onto the bed any which way, click on AutoScan, and away you go. *Ofoto* first scans the picture at low resolution to determine which part of the scan area actually contains the image and whether it's line art or a photo. Then the image is rescanned at high resolution, automatically adjusted for brightness and contrast, sharpened, straightened, and finally cropped. All the while, *Ofoto* keeps you informed of its progress. If you wish, you can make all these adjustments manually; the program offers scaling and rotation tools to make this easier.

In addition to *Ofoto*, the Apple OneScanner comes bundled with a demo version of Caere's *OmniPage Direct* OCR software. *Ofoto* is available as a stand-alone package for $295 and works with a variety of scanners, such as the Hewlett-Packard ScanJet.

—*Bruce Kinnaird*

IN BRIEF

Apple OneScanner for Windows

The scanner for the Macintosh market is now available for PC users thanks to the Windows version of Ofoto.

Apple Computer Corp.
20525 Mariani Ave.
Cupertino, CA 95014
800/776-2333
Reader service no. 611

Zenith Delivers Notebooks That Network

Every time you turn around, notebook PCs get smaller, faster, or lighter. Now Zenith Data Systems (ZDS) has done its part to make them better connected as well.

With its Z-Note line, ZDS has become the first major notebook PC maker to integrate networking hardware and software directly into the system. Each of the 386SL-based notebooks has built-in Ethernet circuitry and comes with shell software for Novell's NetWare, Microsoft's *LAN Manager*, and Banyan's VINES preinstalled on the hard disk. In addition, ZDS has jettisoned the bulky and often expensive "docking station" approach to desktop connectivity in favor of a space-efficient, $149 "port replicator" for connecting the notebooks to external devices when they're in the office.

The Z-Note line includes three 5.9-pound monochrome models and a 6.5-pound unit with an active-matrix color LCD. The Z-Note 320L Model 60 is built around a 20-MHz 386SL processor, comes with 2MB of RAM and a 60MB hard disk, and has a 10-inch, edge-lit monochrome LCD that can display 64 shades of gray. Two 25-MHz models also sport the same monochrome LCD and come with 4MB of RAM and 85MB and 120MB hard disks, respectively.

All three monochrome notebooks can be upgraded to the 9-inch, active-matrix, thin-film transistor (TFT) color LCD of the Z-Note 325Lc Model 120, which uses a 25-MHz SL processor and comes with 4MB of RAM and a 120MB hard disk. All four Z-Note models have a 3½-inch, 1.44MB floppy drive that can be upgraded to a 2.88MB drive in the fourth quarter.

List prices range from $3599 for the 320L Model 60 to $7299 for the color 325Lc Model 120, with street prices expected to be between $2600 and $5300.

For those prices, you get nickel-hydride batteries and power management features that offer up to 4 hours of continuous operation for the monochrome models and 2½ hours for the color note. All come with a 64K cache, 128K of user-upgradable flash ROM, an enhanced parallel port (EPP), and an external super-VGA port that supports simultaneous video. The Ethernet-compatible, high-speed communications port boasts data transfer rates that are more than 50 percent faster than typical AT-compatible Ethernet cards and more than four times faster than portable LAN adapters connected to a standard parallel port, ZDS officials claim. The Z-Notes come bundled with a Logitech TrackMan portable trackball and DOS 5.0 and *Windows 3.1* preinstalled. —*Rob Garretson*

IN BRIEF

Z-Note 325Lc Model 120, 325L Model 85, 325L Model 120, 320L Model 60

These notebooks, including an active-matrix color model, come with built-in networking hardware and software.

Zenith Data Systems
2150 E. Lake Cook Rd.
Buffalo Grove, IL 60089
800/553-0331
Reader service no. 612

Zenith's Z-Note 386SL notebooks have built-in Ethernet circuitry and preinstalled shell software for networking.

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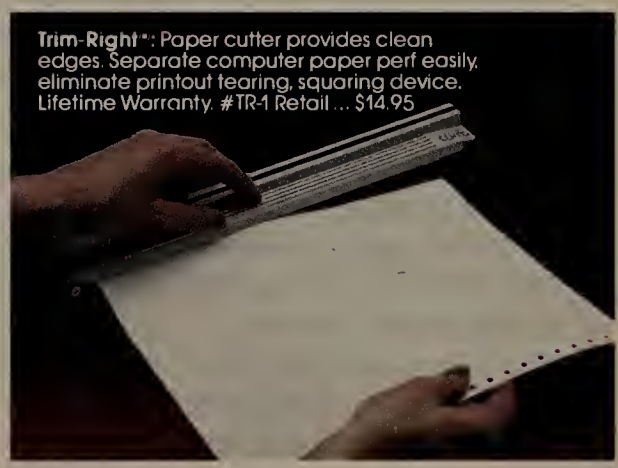

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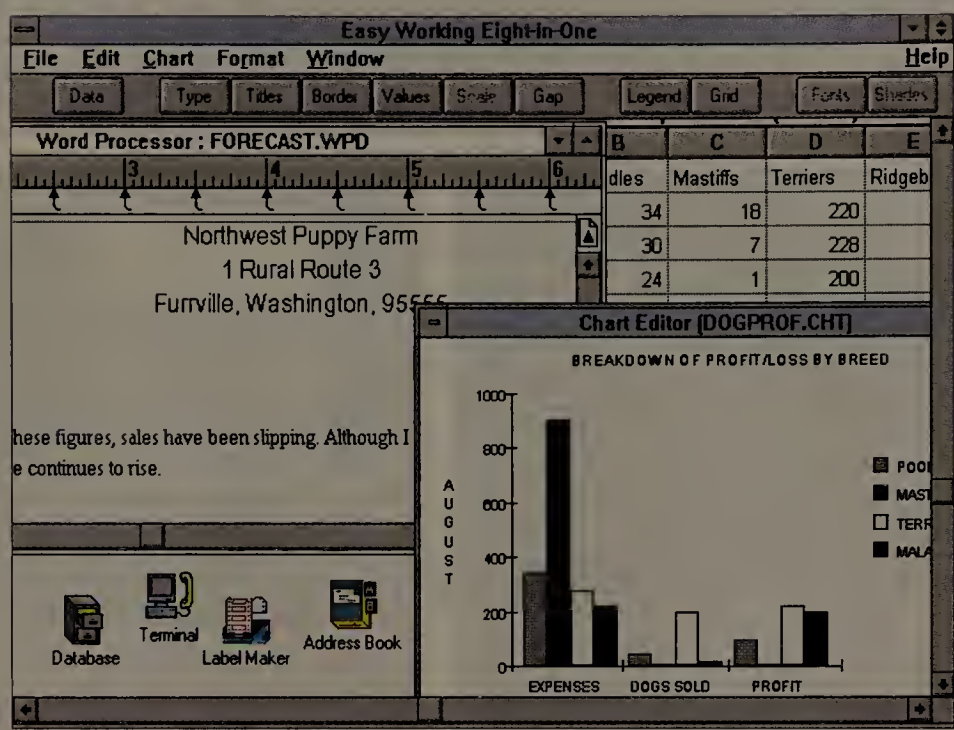
Spinnaker Unfurls Eight Low-Cost Entry-Level Business Applications

Like a team of office assistants, these applications help you with mailings, letters, planning, business planning, and publishing.



Spinnaker's Easy Working for Windows Eight-in-One integrates word processing, spreadsheet, data base, address book, label maker, outliner, chart, and communications software to provide a suite of office tools.

Spinnaker has added three new applications to its popular *PFS* line and brought out five low-cost *Windows* versions of its *Easy Working for DOS* applications. Anyone who truly hates to part with their hard-earned cash for software will want to check out these price tags.

With style sheets, scalable fonts, clip art, and predefined templates, *PFS:Publisher for Windows* stretches your nickel a long way. You can create a custom palette of QuickButton icons to automate often repeated tasks. The $149 program does manual kerning, drop caps, and halftones and easily wraps text around irregularly shaped objects. The application also includes a thesaurus, spelling checker, and hyphenation dictionary.

The $129 *PFS:Business Plan for Windows* is an integrated spreadsheet, word processor, and chart program that teaches you to write a business plan. For instance, as you're writing the Executive Summary, a description of what it should contain and advice on how to write it shares the screen with your document. The formulas for financial models are already in the spreadsheet module, so you just enter numbers to create financial reports. The spreadsheets are *1-2-3* compatible, and you can select from eight exciting chart types to display your spreadsheet data.

A handy DOS-based package, *PFS:Prospect* keeps track of contacts and the attention they require. For $129, a data base stores names, addresses, and relevant notes. Reports and letters are a snap to generate, so you can instantly fire out a follow-up letter while you're still on the phone. *PFS:Prospect* includes a calendar and a to-do list that moves a task to the next day until you mark it done. It'll even dial the phone for you.

The *Easy Working for Windows* product line combines aggressive prices with ease of use—and in some cases, competitive functionality. If you don't expect much from a $49.95 word processor, for example, *Easy Working for Windows Word Processor* is going to surprise you. It has an integrated address book and label maker; manual kerning; automatic indexing; footnotes; tools for drawing rectangles, lines, and ovals; find and replace; and borders and shading. The package includes 30 scalable fonts, a spelling checker, and a thesaurus. You can customize your own style sheets or use one of the included templates or business style sheets.

Easy Working for Windows Eight-in-One provides all the essential business tools in exchange for very little cash: word processor, spreadsheet, chart maker, dBASE-compatible data base, communications program, address book, label maker, and outliner.

Although the features are not always completely integrated, you can quickly create a smart-looking document by incorporating graphics and charts into your letter and then create a mail merge using names in your address book. This bundle of tools includes a spelling checker and a thesaurus, and it retails for only $59.95.

Easy Working for Windows Desktop Publisher doesn't have the customizable QuickButtons that come with *PFS: Publisher*, and it can't do irregular text wrapping. But it does do multiple columns, borders, customizable style sheets, shading, lines, and boxes. It imports text and graphics from most popular formats and comes with a host of predesigned templates, gallery of clip art, 50 scalable fonts, spelling checker, and thesaurus. And it costs less than a teenager spends on jeans—$49.95.

Easy Working for Windows Mail Manager takes the annoyance out of mass mailings by combining a word processor with a data base and a label maker. Its predefined data base gets you merging right away. And it comes with 50 prewritten business letters, a spelling checker, and a thesaurus for $49.95.

Easy Working for Windows Business Letters' 250 professionally written business letters cover a wide range of needs, from lunch invitations to letters negotiating pay. It's designed to save the time and effort required to compose polished letters from scratch, and it's also an adequate word processor with a thesaurus, a spelling checker, and a label maker. Retail price: $49.95.

—*Christina Wood*

IN BRIEF

PFS line, Easy Working line

WINDOWS Eight entry-level packages help you with everything from desktop publishing to basic office tasks.

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PowerPoint 3.0: More Power to Make Your Point

When *Windows 3.1* came to town, you'd better believe *PowerPoint* was ready and waiting. Microsoft's $495 presentations package has polished its shoes, combed its hair, and put on some shiny new duds in version 3.0—including a real outline view and a whole passel of *Windows 3.1*–specific features.

Version 3.0's biggest improvement is its long-awaited outliner. Now you can organize your ideas inside *PowerPoint* and format them on the fly. You can view actual fonts and make style changes in the outline view without having to switch to the slide view. Outline and slide views are fully integrated: Change the order of bulleted items on a slide, and the outline changes too.

Version 3.0 makes creating presentations easier by adding an *Excel*-like tool bar to every view. Just click on icons to change text to boldface or italic, resize objects, add shadow effects, and more.

PowerPoint also gives you more ways to dress up your text charts. Version 3.0 augments *Windows 3.1*'s 14 scalable TrueType fonts with 22 of its own, creating a full quiver of PostScript equivalents that can be used by any *Windows* application. Even better, the PostScript fonts can be saved along with your presentation—a big plus when sending presentations to a slide bureau that doesn't have the TrueType fonts you want to use.

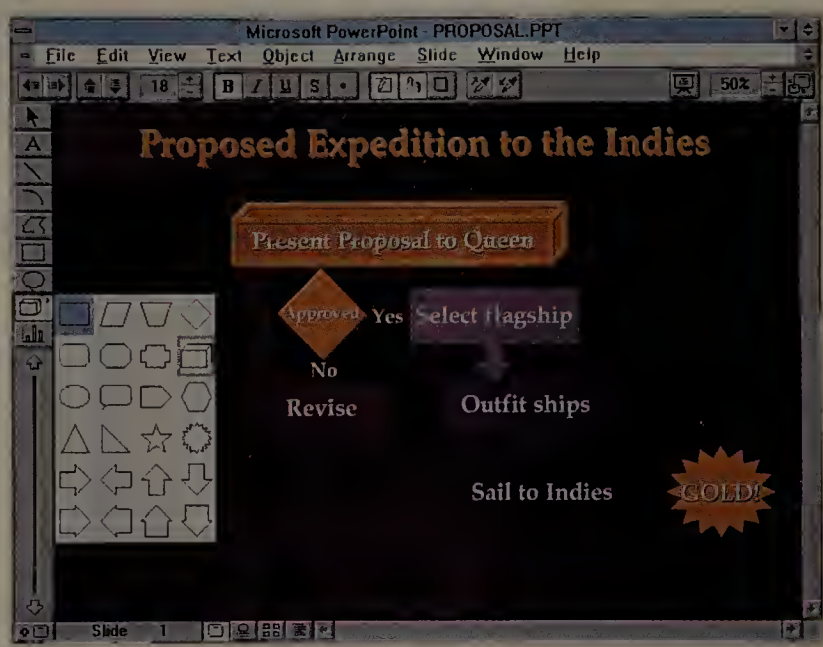
And you get more tools for making your presentations stand out. You can create true 3-D graphs (using *x*, *y*, and *z* axes) and select from 24 different shapes—such as diamonds, cubes, and star bursts—to create organization or flow charts. You can even animate your charts with bulleted items that "fly in" from the sides, top, or bottom.

PowerPoint's 150 preset templates let you specify colors, fonts, borders, and other style elements with a mouse click. *3.0* lets you swap templates without losing edits to slides and save a presentation as a custom template.

Not surprisingly, *PowerPoint* takes full advantage of *Windows 3.1*'s OLE technology, allowing you, for example, to embed an on-screen slide show inside a *WinWord* document. Casting an eye toward the future, *PowerPoint 3.0* also includes hooks for multimedia sound and video, plus support for Microsoft's pen-based version of *Windows*.

To use all this stuff, you need at least a 386 with 2MB of RAM and *Windows 3.1*, plus 5MB to 17MB of disk space. Upgrades are free for users who purchased *PowerPoint 2.0* after March 1, 1992; $99 for other *PowerPoint* users.

—*Daniel Tynan*



PowerPoint 3.0 has more tools to make your presentations stand out. You can select from 24 shapes to create flow charts.

IN BRIEF

Microsoft PowerPoint 3.0 for Windows

WINDOWS An integrated outliner and a bevy of other enhancements make it even easier to create eye-popping presentations.

Microsoft Corp.
One Microsoft Way
Redmond, WA 98052-6399
206/882-8080,
206/936-7329 (fax)
Reader service no. 614

IntelliDraw: Another Draw Program From Aldus?

How is Aldus like a three-star restaurant? Both of them offer so many fine courses, we can't possibly all agree on one. Aldus already has the sophisticated draw program *FreeHand* on both the PC and the Mac. And now it's giving us *IntelliDraw*, an entry-level draw package, which also runs on both platforms. Why?

Aldus feels there is an audience of would-be users who want a functional draw tool but don't want to pay for or learn a high-end package. With a retail price of $299, *IntelliDraw* falls between high-end packages such as *CorelDraw* and low-end ones like *Micrografx Draw*.

IntelliDraw is distinguished from other entry-level draw programs by innovations such as the Symmetrigon. You draw one-half of an object, and the Symmetrigon completes it with a mirror image. Or you can combine basic shapes, drop out unwanted parts, and cut holes to make new, complex shapes. When you clone any object—even bit maps—and change the master, all its clones change. *IntelliDraw* also does multiple layers and editable blends.

Its primitive animation capability lets you "teach" your drawing a path of movement. For example, if you put a vase on a table and drag it off the edge and onto the floor, *IntelliDraw* will replay the sequence on request.

IntelliDraw will bend text on a curve; text that's been reshaped remains editable. Instead of the usual clip art, *IntelliDraw* has "flip books" of pictures that can easily be customized. For instance, a flip book bicycle yields numerous choices for seats, handlebars, and other parts you can use to assemble your own vehicle.

Many of these features are unique or inspired by high-end CAD applications. But Aldus claims to have made *IntelliDraw* so simple that a novice can get up to speed quickly.

—*Christina Wood*

IN BRIEF

IntelliDraw

Innovative features and ease of use characterize this draw program.

Aldus Corp.
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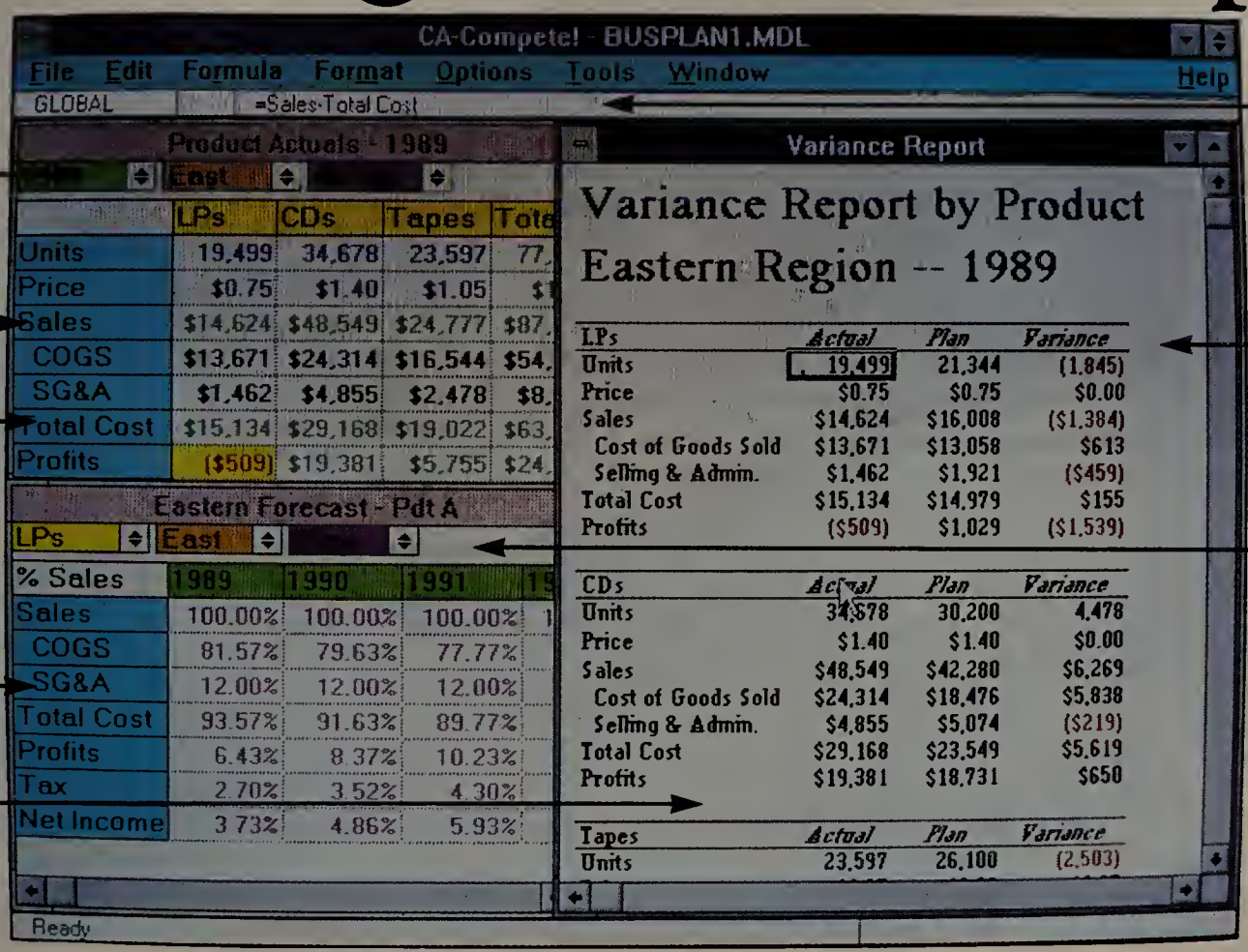

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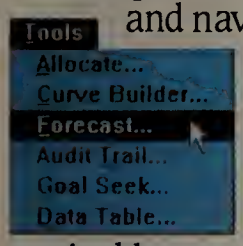

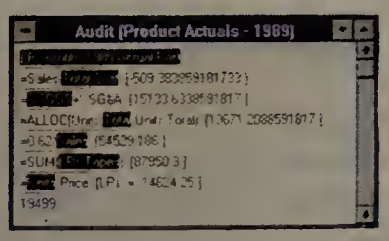

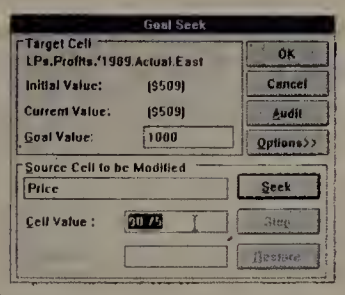

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Multitasking Between Windows, DOS, and UNIX

Quarterdeck's Desqview-X is one multitalented multitasker. You can run DOS text applications and Windows programs concurrently, and run them side by side with UNIX X-applications.

Quarterdeck's *Desqview-X* is a multitasker with multiple capabilities. Not only can you run DOS text applications and *Windows* programs concurrently, but thanks to a platform-independent protocol, you can run them side by side with UNIX X-applications.

Desqview-X really shines in mixed-platform networked environments. The Mark and Transfer feature, a cut-and-paste function, lets you paste between text-based applications or into graphical programs, be they DOS, *Windows*, or UNIX. However, there is still no support for cutting and pasting bit-mapped or vector graphics, nor can you copy or cut from a graphical application, such as *Word for Windows* or *PowerPoint*, into a text-based one, such as *WordPerfect 5.0*. You can also use the tree-based file manager to copy, delete, move, or rename files and directories between two platforms, or between two windows, locally.

With *Desqview-X*, you can use the machines on your network to create a distributed processing system. Any UNIX workstation with an X-Windows front end can connect to PCs running *Desqview-X* and remotely run DOS text applications or *Windows*. DOS users can access X-applications remotely, run DOS text and *Windows* applications locally, or connect to another *Desqview-X* machine on the network to run these programs remotely. You cannot remotely run DOS graphics programs, such as *Harvard Graphics* or *Ventura Publisher for GEM*.

Unlike *Desqview/386*, which is a text-based environment, *Desqview-X* uses the X-Windows graphics standard to create a multiplatform graphical environment in which you can customize menus. You may add nested program subgroups or internal *Desqview* commands anyplace on the menu.

Desqview-X also includes a print spooler, file viewer, icon editor, and *Adobe Type Manager*. You even get more styles and control over DOS fonts than you do in *Windows 3.1*.

Desqview-X requires a 386SX, 4MB of RAM, and 10MB of hard disk space and retails for $275. Quarterdeck users can upgrade to this multitasker for $100.

—Lenny Bailes

IN BRIEF

Desqview-X 1.01

WINDOWS This multitasking environment lets you run text-based DOS, Windows, and UNIX applications simultaneously on the same screen.

Quarterdeck Office Systems
150 Pico Blvd.
Santa Monica, CA 90405
310/392-9851
Reader service no. 618

WordPerfect Tools Make It Easy

Two new utilities for *WordPerfect* promise to automate some of the most tedious aspects of document production: hunting for addresses and converting files.

If you're a *WordPerfect* user who hates having to hunt through that three-foot stack of letters sitting on your desk for that letter you wrote to Joe in Memphis, *Utley-Cross Correspondence Manager* is an intelligent alternative. The program creates a complete name and address book from memos, letters, and documents already existing in your *WordPerfect* files.

It locates all *WordPerfect* correspondence on your hard disk and lets you retrieve by category such as proper name, author, typist, date, addressee, town, state, and ZIP code rather than file name.

To find the addresses of "those guys in Memphis in 1988," select "Memphis" from the town list and "1988" from the date list. You can view the set of letters, back up, copy, move, edit, or delete them. *Correspondence Manager* doesn't do a complete text search, but for $89 it's cheaper than most other personal information managers.

Joining the likes of *Software Bridge* and *Word for Word* in the file conversion arena is WordPerfect's *ConvertPerfect 1.0*, a conversion program that converts more than 40 DOS and *Windows* word processing file formats to and from *WordPerfect 5.1*.

Using it is easy. Just select a file or directory for conversion from a list of files, and the program sniffs out the source format. Or you can select a source and destination format yourself. *ConvertPerfect 1.0* retails for $49.

—Bronwyn Fryer

IN BRIEF

Utley-Cross Correspondence Manager

A utility that stores names and addresses.

The Utley-Cross Company
46 Middle Rd.
Boxborough, MA 01719
508/263-0386
Reader service no. 616

ConvertPerfect 1.0

This utility converts 40 word processing file formats.

WordPerfect Corp.
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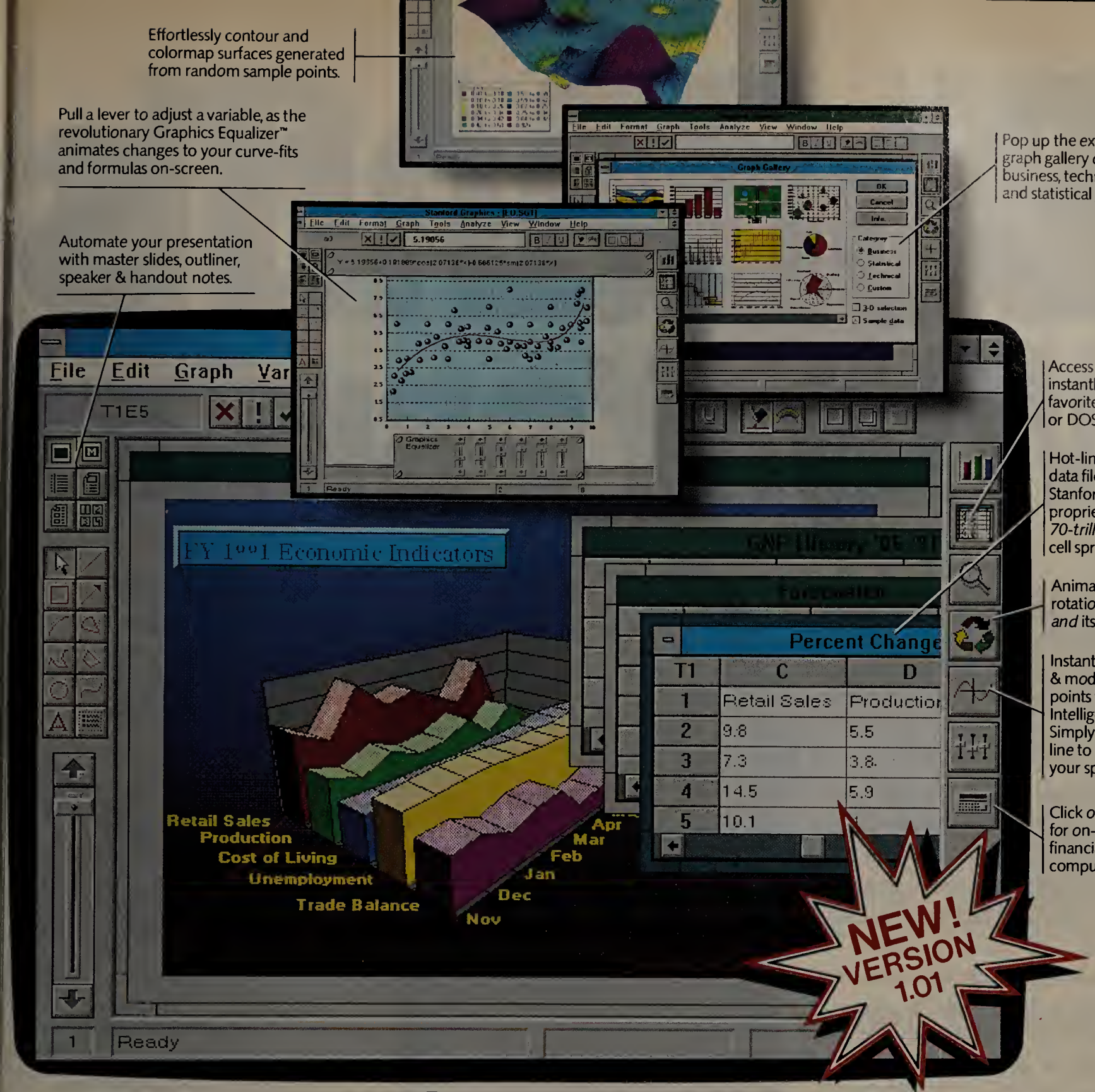

STANFORD GRAPHICS FOR WINDOWS

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– PC Magazine
March, 1992

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Sept., 1991

"Stanford Graphics slams the competition..."
– Infoworld
April, 1992

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The development, maintenance, and implementation of this product have no connection with Stanford University.

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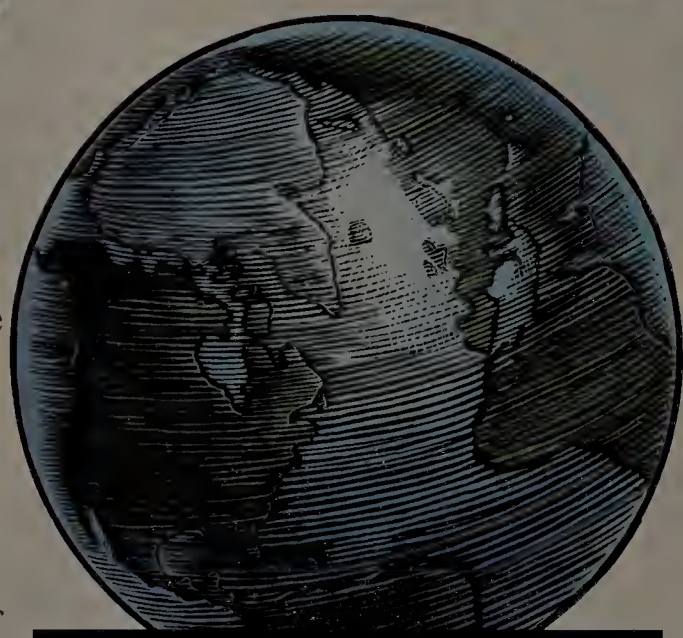

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Send me my FREE Pro Pack Software!

Purchase dBASE IV v1.5 before September 30, 1992, and Borland will give you Central Point Software's Backup and Anti-Virus programs *free*.* That's a suggested retail value of $258.

Check OOS disk size required: ☐ 5 1/4" ☐ 3 1/2"

dBASE IV v1.5 Serial #:_____

Name:_____

Company:_____

Address:_____ (We cannot ship to P.O boxes.)

City/State/Province:_____

Zip/Postal Code:_____ Phone: ( )_____ FAX: ( )_____

COMPLETE this coupon, ATTACH a copy of your sales receipt (or a copy of purchase order and billing invoice) AND ENCLOSE $9.00 U.S. for shipping and handling (check or money order payable to Borland International, Inc.).

Send to: Borland's Pro Pack Offer, P.O. Box 7243, San Francisco, California 94120-7243.

*Offer good in U.S. and Canada only on dBASE IV v1.5 purchases between June 1 and September 30, 1992. Only original coupons will be accepted. No responsibility is assumed for lost, late, misdirected, or destroyed mail. Please allow 4–6 weeks for delivery. Subject to all local, state, and federal regulations. Void where prohibited. Offer not valid for Upgrades, Competitive Upgrades, LAN Packs, Volume Packs, or any other Borland promotion except dBASE IV v1.5 products. Distributors and resellers not eligible to participate. Central Point is a registered trademark of Central Point Software.

BORLAND

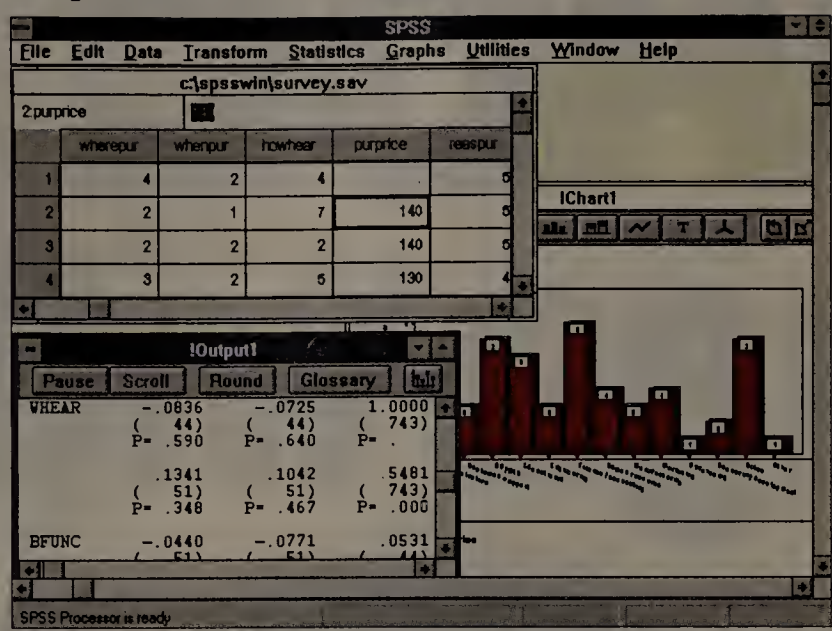
dBASE IV from Ashton-Tate,® a Borland Company

Circle 13 on reader service card

Easy Statistical Analysis for dBASE, Spreadsheets

Until now, statistics was a course most of us took in college and happily forgot. Those who wanted to do means comparisons or linear regression were often put off by arcane or underpowered DOS products. Others simply had to rely on MIS and the company mainframe.

No more. SPSS, a leading statistical software developer, is shipping a *Windows* version of its namesake product that has all the functions of its mainframe big brother. Yet it's a breeze to use for anyone with a basic understanding of statistical concepts.



SPSS makes statistical analyses point-and-click easy—although a basic understanding of statistics is recommended.

SPSS for Windows reads tab-delimited, *1-2-3*, *Excel*, *dBASE*, and SYLK files and imports *SQL Server* data. Data management, including a spreadsheetlike data editor, data transformations, and descriptive and inferential statistics, as well as extensive graphics are just a mouse click away. *SPSS for Windows* also supports DDE and OLE, so you can link your analyses to data in *Windows* spreadsheets and data base applications.

Previous versions of *SPSS* relied on a command language to read data and generate statistics. *SPSS for Windows* can run those macros and programs without modification. In fact, *SPSS for Windows* will automatically generate the command language if desired, so you develop an analysis on your PC and run the resulting programs on any number of the more than 60 platforms *SPSS* supports.

SPSS officials say the product offers far more functionality than their DOS package, *SPSS/PC+*, which they plan to enhance later this year. *SPSS for Windows* runs on a 286 with 4MB of RAM. The base package is $395 until September 30, $695 thereafter.

—Peter D. Varhol

IN BRIEF

SPSS for Windows

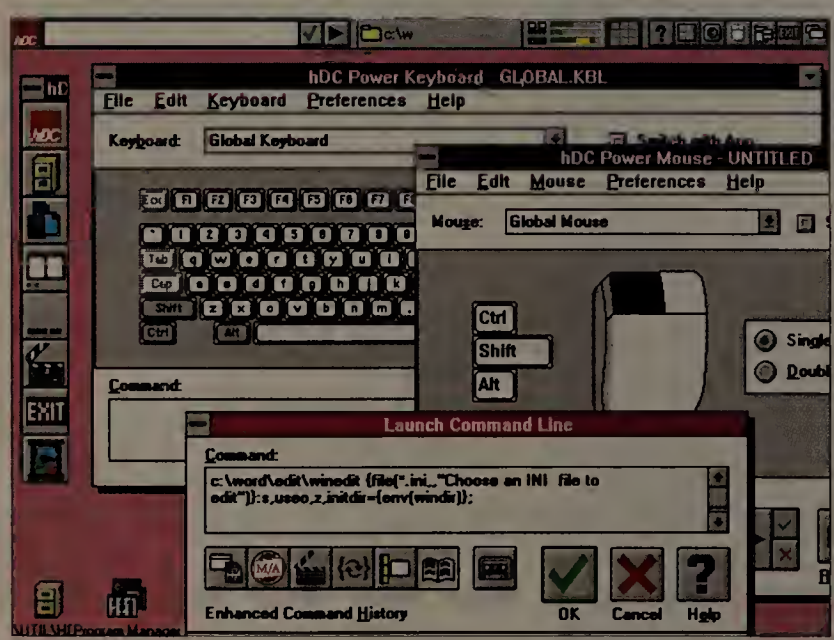
WINDOWS Excel, 1-2-3, and dBASE users who are familiar with statistics will find that SPSS for Windows lets them cut and view data in more ways than ever before.

SPSS, Inc.
444 N. Michigan Ave.
Chicago, IL 60611
800/543-9262,
312/329-3668 (fax)
Reader service no. 619

Power Launcher 2.0: Take Control of Windows

Power Launcher from hDC has been refurbished, providing a glitzy collection of *Windows* utilities that let you create custom button palettes, remap your mouse and keyboard, and launch *Windows* applications, commands, and scripts.

New in version 2.0 is a tool bar that lets you launch applications and macros, using what hDC calls "enhanced commands." Activated from a command line on the tool bar, the Enhanced Commands function enables you to initiate scripts, applications, and macros and execute DDE commands. You can create custom menu options, add tools to your applications, and create application-specific floating toolboxes. The slim tool bar also holds a map of the product's virtual desktop, which provides the equivalent of 64 *Windows* screens and a bar chart that reports on system resources, memory, and disk space.



hDC's Power Launcher features a prominent tool bar that lets you launch applications or macros using "enhanced commands."

Version 2.0 also takes advantage of *Windows 3.1* with buttons that act as drag-and-drop targets, an Action Editor for creating linked and embedded objects to insert in OLE-client applications, and support for sound.

Power Launcher lets you launch any application and control its initial directory, window position, and size and even change the text in its title bar. A macro language permits more advanced customizing. Although arcane and limited in power, it lets you edit macros, something you can't do with *Windows'* Recorder.

Power Launcher 2.0 retails for $99.95, with upgrades from *1.0* available for $19.95.

—Scott Dunn

IN BRIEF

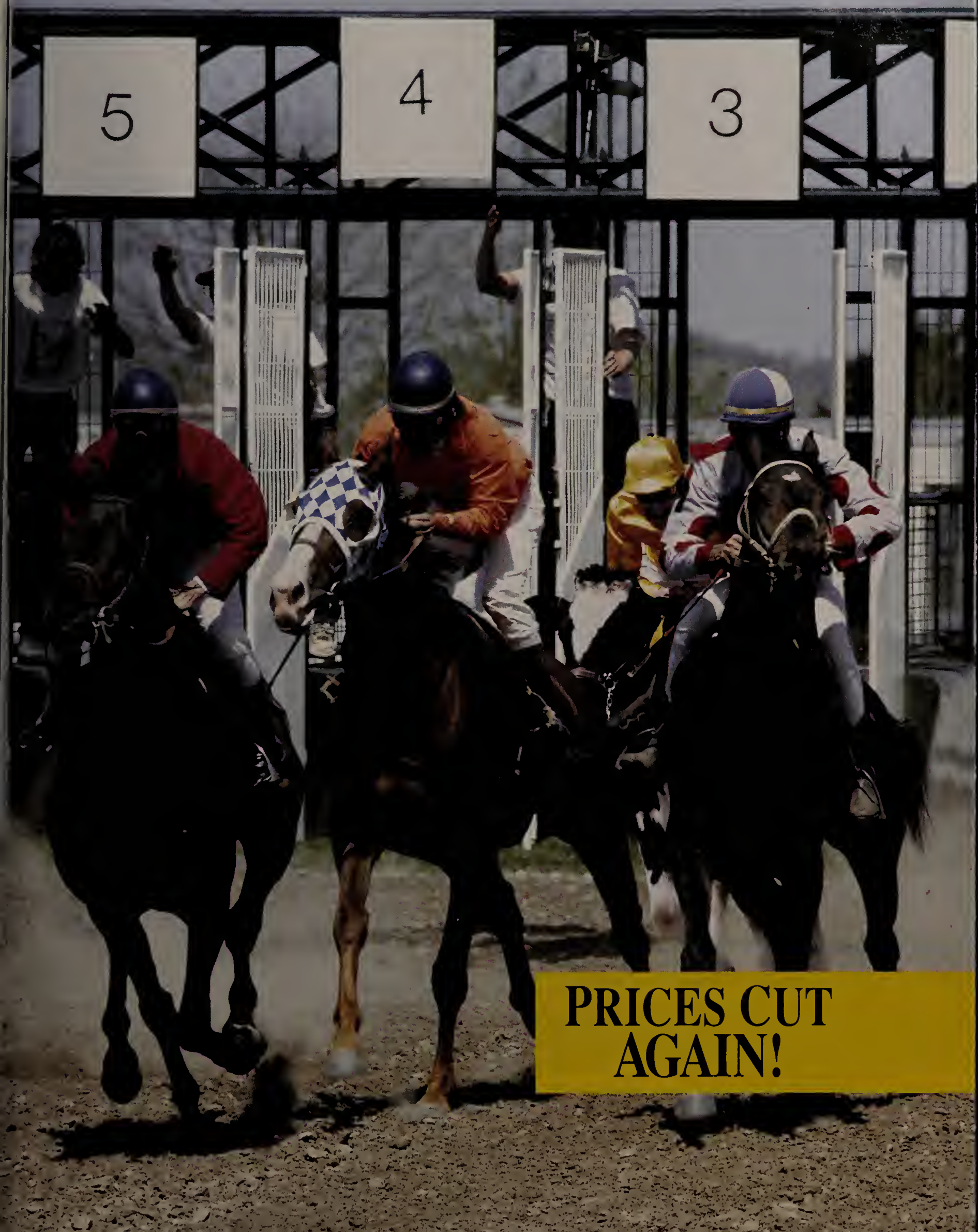
Power Launcher 2.0

WINDOWS This utility lets you customize the way you use Windows.

hDC Computer Corp.
6742 185th Ave. NE
Redmond, WA 98052
206/885-5550,
206/881-9770 (fax)
Reader service no. 620

(continues on page 93)

Can You Spot The Winner?

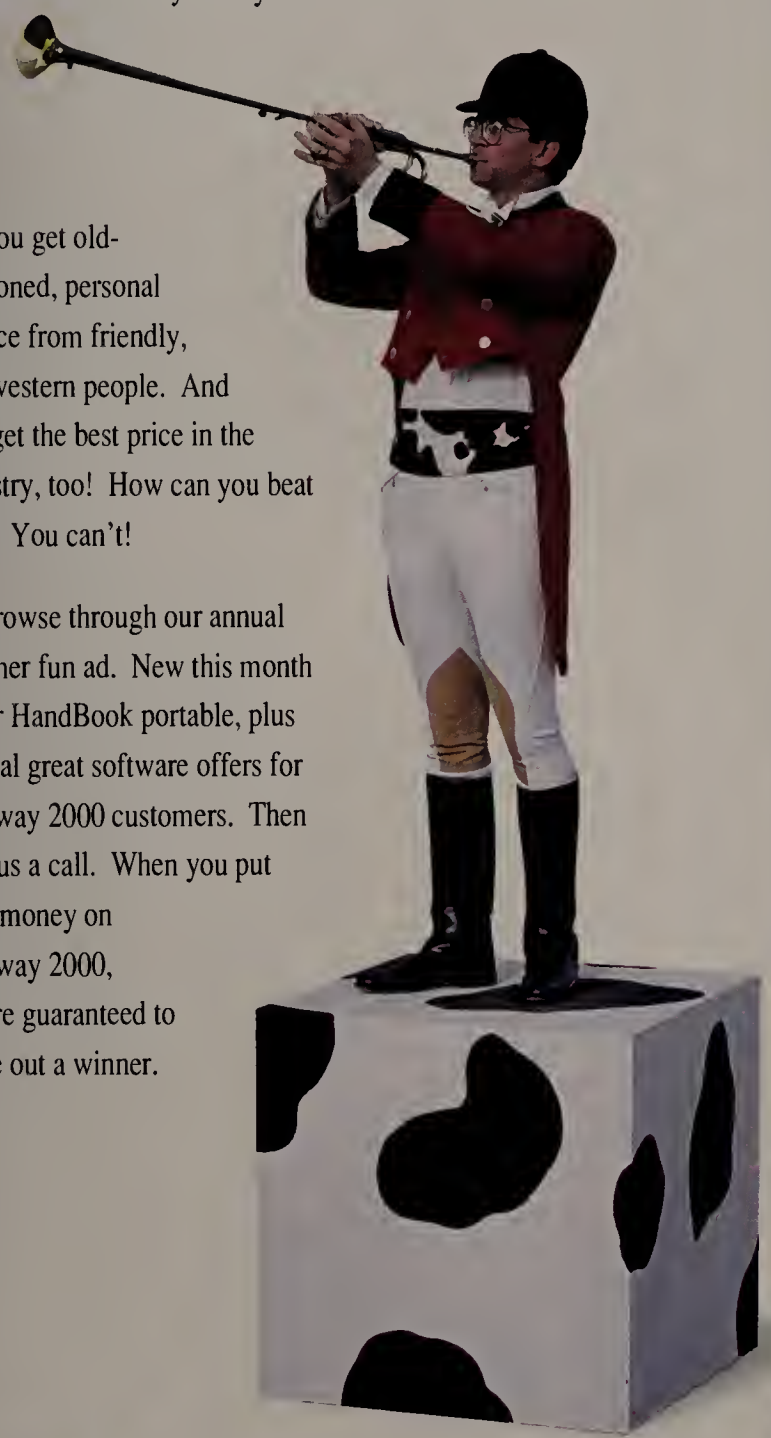


PRICES CUT AGAIN!

The Choice Is
Black & White!
ATOKAD PARK

The results are final — all those thoroughbred "favorites" outdistanced by a simple, determined, black-and-white cow.

There's a big payoff for you if you picked Gateway 2000. You get a quality, high-performance system with the number-one customer satisfaction and reliability ratings in the industry, according to *PC Magazine* readers in the 1992 service and reliability survey.



You get old-fashioned, personal service from friendly, Midwestern people. And you get the best price in the industry, too! How can you beat that? You can't!

Browse through our annual summer fun ad. New this month is our HandBook portable, plus several great software offers for Gateway 2000 customers. Then give us a call. When you put your money on Gateway 2000, you're guaranteed to come out a winner.

GATEWAY2000

"You've got a friend in the business."

PORTABLES

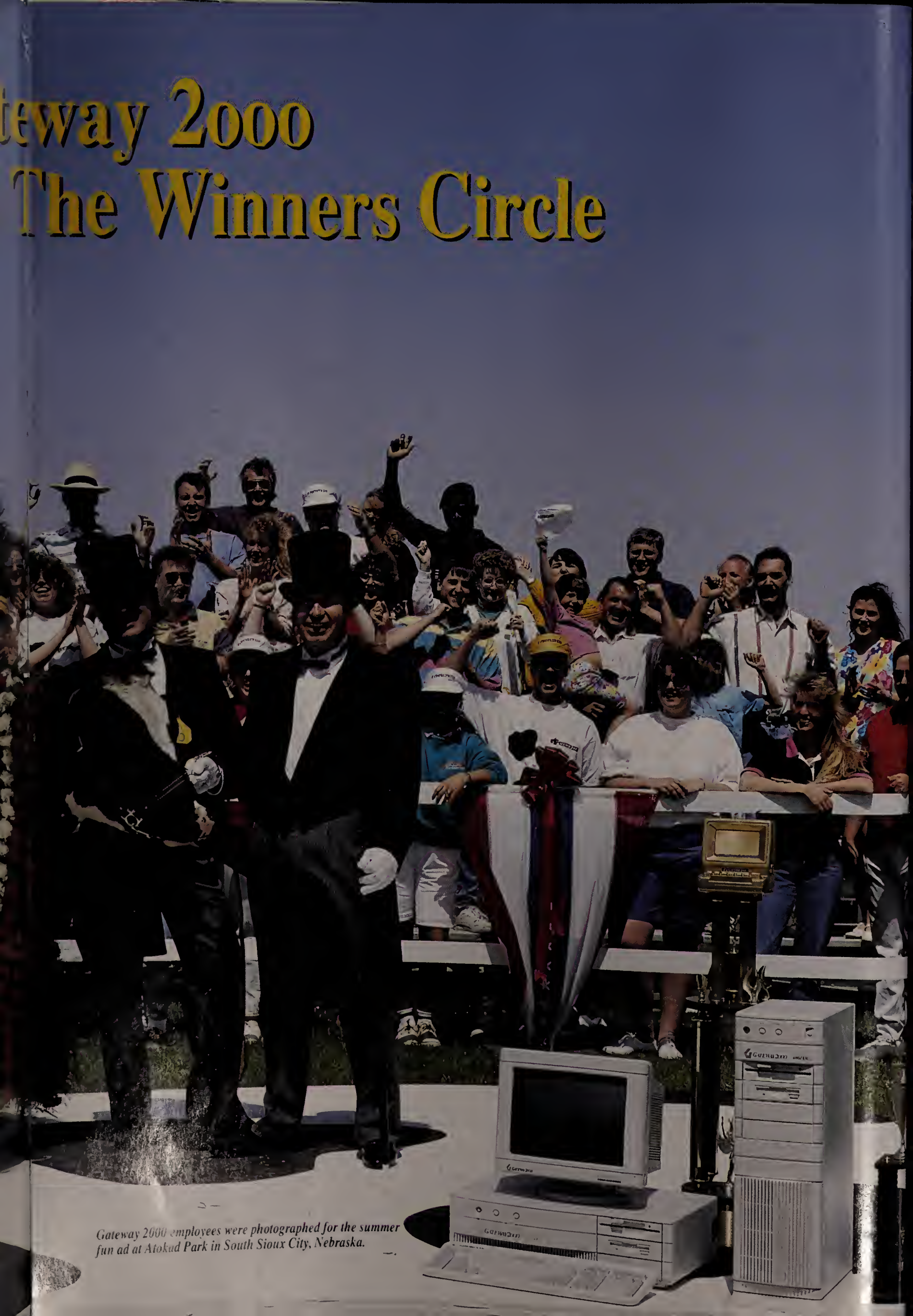
486 SYSTEMS

SERVICE

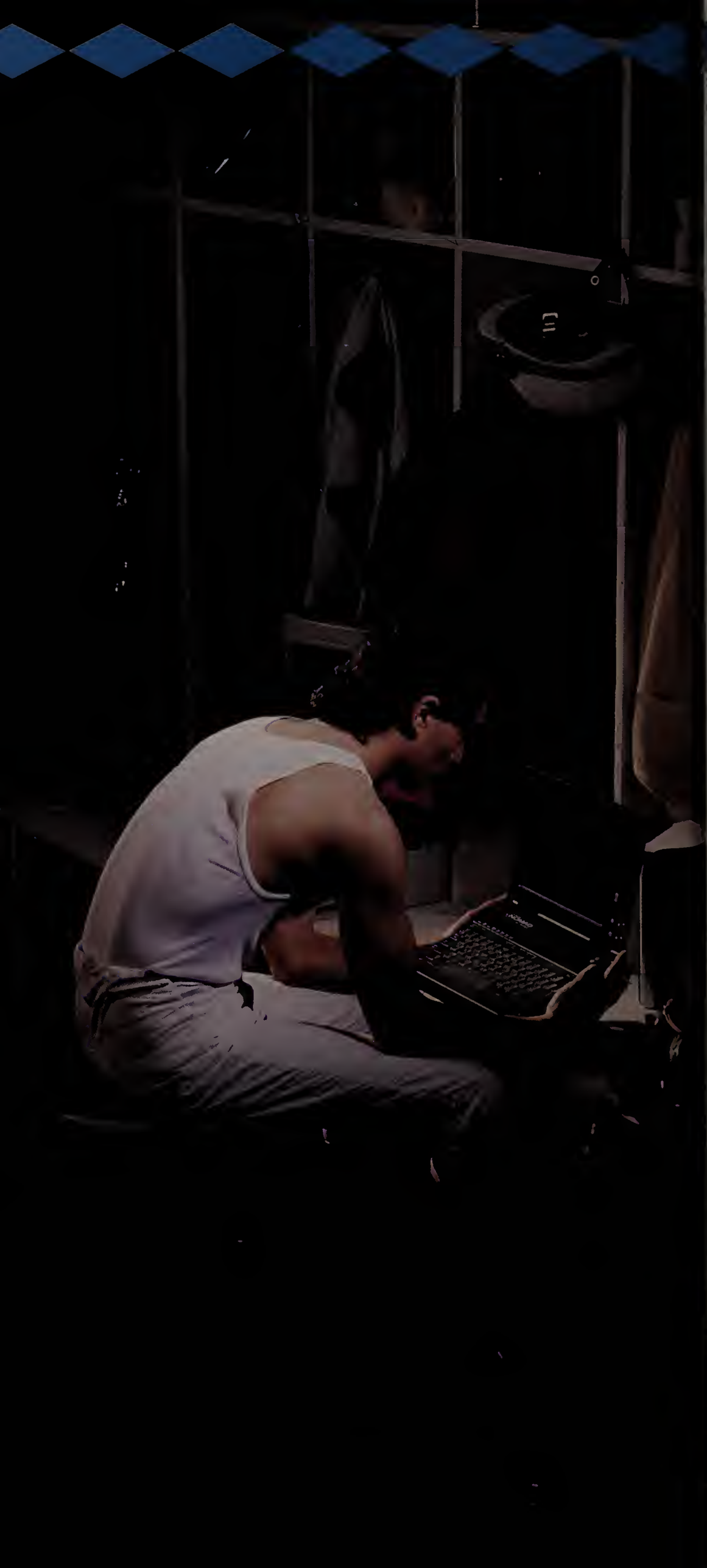
OPTIONS

It's Gate
That Puts You In T

teway 2000
The Winners Circle



Gateway 2000 employees were photographed for the summer fun ad at Atokad Park in South Sioux City, Nebraska.



Gateway 20
Put You In

The Nomad Series

Our small, lightweight Nomad
mance anywhere you go. Nomad
pointing device), built-in floppy dr
A patented power-management sys
six hours of operation from a single

The Nomads have a bright, crisp
is 640 x 480, 64 gray scale, on the
external monitor.

All these features ... and the No

Nomad 325SXL ■ $199
25MHz, 386SXL processor ■ 4M

Nomad 420SXL ■ $269
20MHz, Intel® 486SXLP processo

Nomad 425DXL ■ $349
25MHz, Intel 486DXLP processo

For The Power User O

Nomad Combo ■ $399

Since the Nomad 425DXL has
portable/desktop combination sys
Combo Highlights: Nomad 425D
mable 124-key AnyKey™ keyboa

The HandBook™

If you like to travel light, you
pounds and measures roughly 6
performance and real PC features
and a comfortable keyboard (no
to your office computer is easy w

HandBook ■ $1295

For The Executive On

HandBook Combo ■ $

Combine the portability of o
with communication capabilities
Combo Highlights: HandBook
■ 33MHz 486DX system with

GATEWAY 2000 NOTEBOOKS PUT YOU IN RACING FORM

The Nomad Series

Our small, lightweight Nomad notebook computers let you take desktop computer performance anywhere you go. Nomad models come with VGA graphics, a FieldMouse™ (portable pointing device), built-in floppy drive, and an 80 or 120MB hard drive, depending on the model. A patented power-management system gives you hard-to-beat battery life benchmarks — over six hours of operation from a single battery on the 25MHz 486DX system!

The Nomads have a bright, crisp, backlit, 10-inch triple supertwist VGA screen — resolution is 640 x 480, 64 gray scale, on the LCD. With simultaneous video, you can also display on an external monitor.

All these features ... and the Nomads are made in the U.S.A.!

Nomad 325SXL ■ $1995

25MHz, 386SXL processor ■ 4MB RAM ■ 80MB hard drive

Nomad 420SXL ■ $2695

20MHz, Intel® 486SXLP processor ■ 4MB RAM ■ 80MB hard drive

Nomad 425DXL ■ $3495

25MHz, Intel 486DXLP processor ■ 4MB RAM ■ 120MB hard drive

For The Power User On The Go

Nomad Combo ■ $3995

Since the Nomad 425DXL has all the power of a 486DX desktop system, it's the ideal portable/desktop combination system! Save with this combo package!

Combo Highlights: Nomad 425DXL ■ 15" CrystalScan 1572FS color monitor ■ programmable 124-key AnyKey™ keyboard

The HandBook™

If you like to travel light, you can't go wrong with the HandBook. It weighs only 2.75 pounds and measures roughly 6 x 9 inches — smaller than this magazine! Yet it has 286-class performance and real PC features including a bright, backlit screen, a bonafide 40MB hard drive and a comfortable keyboard (no chiclet keys). Downloading information from your HandBook to your office computer is easy with the serial cable and file transfer software provided.

HandBook ■ $1295

For The Executive On The Go

HandBook Combo ■ $3995

Combine the portability of our HandBook with the power of our 33MHz 486 desktop system with communication capabilities — and you have a terrific combo, Gateway value-priced!

Combo Highlights: HandBook with 2,400 bps external modem and communication software ■ 33MHz 486DX system with 120MB IDE hard drive ■ TelePath™ fax/modem package

GATEWAY 2000

"You've got a friend in the business."

Gain The Winning Edge With 486 Performance

Gateway's powerful 486 models give you the winning margin! And when you recap our new price reductions and compare feature-for-feature against the other runners, you'll find you won't even have to play your hunches — Gateway 2000 is the odds-on favorite.

25MHz 486SX ■ $1895

At $1,895, our 486SX/25 is the hottest value on the market. With this system, you get 486 technology, including an 8K internal cache and burst mode, at a 386 price. And besides being faster than any 386 on the market, the 486SX/25 is upgradeable to 50MHz if you need increased performance in the future. ***System Highlights:*** 4MB RAM ■ 120MB Western Digital IDE hard drive ■ ATI™ Graphics Ultra ■ 14" CrystalScan 1024NI VGA color monitor, up to 1024 x 768 non-interlaced resolution ■ desktop model is standard

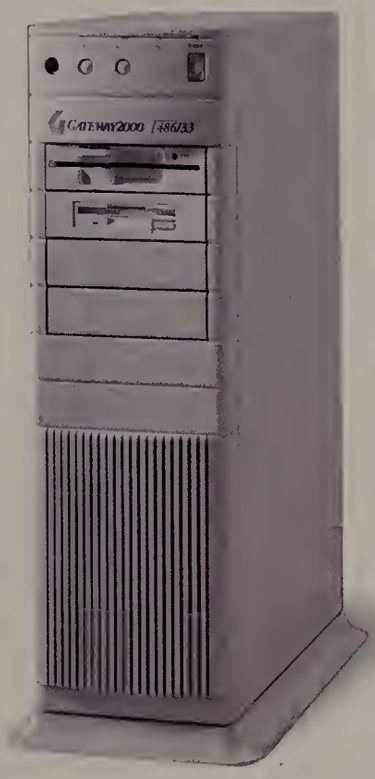
33MHz 486DX ■ $2395

We recently increased performance and lowered the price of our best-selling, award-winning 486DX/33 by adding an ATI Graphics Ultra video card with a graphics coprocessor. At $2,395, the price/performance ratio on this machine is hard to beat. Plus, it's an upgradeable PC. You'll be able to switch to 66MHz later this year. ***System Highlights:*** 64K cache RAM ■ 4MB RAM ■ 200MB Western Digital IDE hard drive ■ ATI Graphics Ultra ■ 14" CrystalScan 1024NI VGA color monitor, up to 1024 x 768 non-interlaced resolution ■ desktop model is standard

50MHz 486DX2 ■ $2695

Gateway 2000's new 486DX2/50 systems, ISA and EISA, incorporate Intel's speed doubler technology. The internal core of the DX2 processor executes at 50MHz while communicating with the external memory bus at 25MHz. Our benchmarks show a 35% increase in performance over a 33MHz 486DX PC.

The high-performance ATI card is standard on the 486DX2/50 as well, plus this system incorporates our new RIDE technology for faster disk operations. RIDE stands for Rapid Integrated Drive Electronics. RIDE technology takes advantage of our new system BIOS that allows the drive to transfer bigger data blocks at one time. Our Coretest benchmarks show large block disk-to-memory operations are over 30% faster with RIDE. For example, you'll notice the increased performance whenever you type WIN at the system prompt, or when you double-click on an icon in Windows. It's much faster. Our product marketing director claims the 486DX2/50 with the ATI video card and RIDE is the fastest personal computer he's ever used!



System Highlights: 64K cache RAM ■ 8MB RAM ■ 200MB Western Digital IDE hard drive with RIDE BIOS ■ ATI Graphics Ultra ■ 14" CrystalScan 1024NI VGA color monitor, up to 1024 x 768 non-interlaced resolution ■ desktop model is standard

EISA SYSTEMS

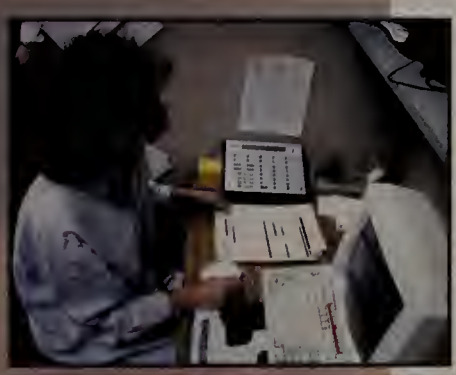
Our product line includes two EISA systems — a 33MHz 486DX and a 50MHz 486DX2. Both EISA systems now come standard in a floor-standing tower model, and include large, fast SCSI drives and EISA SCSI controllers. RAM cache is expandable to 256K. The 486DX/33 EISA will be upgradeable to 66MHz later this year.

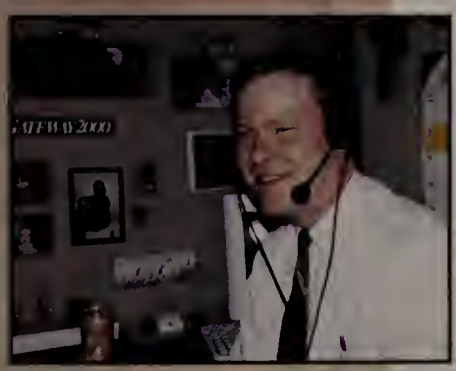
System Highlights: 128K cache RAM ■ 8MB RAM ■ 340MB Maxtor® SCSI hard drive ■ 32-bit EISA SCSI controller ■ 16-bit Diamond Speedstar Plus SVGA graphics with 1MB ■ 14" CrystalScan 1024NI VGA color monitor, up to 1024 x 768 non-interlaced resolution ■ floor-standing tower model is standard

486DX/33 EISA ■ $3795 (Upgradeable to 66MHz later this year.)
486DX2/50 EISA ■ $3695

Gateway 2000 systems come fully configured with all the performance features you want, including two floppy drives, a programmable 124-key AnyKey keyboard, a Microsoft® mouse, MS DOS® 5.0, Windows™ 3.1 and your choice of one application software option. See the back pages of this ad for complete configurations and information about software options, upgrades and peripherals.

GATEWAY2000
"You've got a friend in the business."





The Gateway Team Is Behind You All The Way

There's a full team of dedicated service professionals standing behind your Gateway 2000 system. In fact, a recent *PC Magazine* reader survey proved Gateway the clear winner in service and reliability. We whizzed past all the contenders when PC owners were asked, "How likely would you be to buy the same brand system again?" The survey also rated Gateway Number-One in overall system reliability, and we were in the Top Five for tech support and repair service.

Whenever you call our sales number, you get a friendly, human voice — a helpful representative to provide you with information. In our customer support department, we have over 200 people on-line to supply free technical support for the life of your machine. They're experienced, rigorously trained and tested and ever patient, friendly and helpful. You'll see why we say "you've got a friend in the business" at Gateway 2000.

In our company mission statement, one of our stated objectives is to exceed customer expectations in quality, service and value. This objective is a personal challenge to each of us at Gateway. We know how important service is to you, which is why we're constantly striving to provide the best in the business.

GATEWAY2000

"You've got a friend in the business."

SERVICE

GATEWAY 2000 ADDS A FREE SOFTWARE BONUS

Choose Your Free Software Option

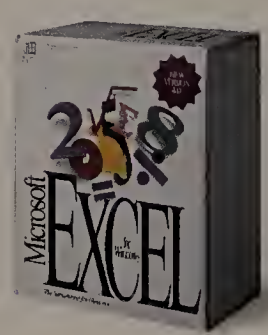
With the purchase of any Gateway 2000 mini desktop, desktop or tower computer system, you receive your choice of one application software option at no additional cost. We'll install your software on your hard drive, optimally configured for your system and Windows, and provide master diskettes and manuals. You may also purchase a second application software option, pre-installed, at extremely competitive prices.

Installation and setup errors are responsible for over one-third of all software problems. You can eliminate that possible source of problems by purchasing your system from Gateway with software pre-installed, tested, and ready to run the moment your system arrives. Add that advantage to the hard-to-beat prices, and Gateway is the only logical choice for PCs and software!

Choose one of the following application software options:

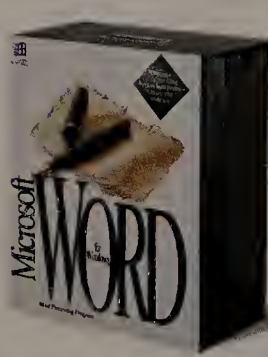
Option #1-*Microsoft Excel for Windows™ 4.0*

■ New version of this powerful spreadsheet, includes online help for *Lotus 1-2-3®* users



Option #2-*Microsoft Word for Windows™ 2.0*

■ Best-selling word processor for Windows. New version 2.0 adds online help for *WordPerfect®* users



Option #3-*Microsoft PowerPoint for Windows™ 2.0*

■ Easy-to-use desktop presentations program creates high-quality overheads and 35mm slides

Option #4-*Borland® Paradox 3.5*

■ The award-winning database from Borland

Option #5-*The Entrepreneur Pack*

■ Includes the latest Windows versions of *Microsoft Works*™, integrating word processing, spreadsheet, and database in one easy-to-use program; *Microsoft Publisher*,™ for creating page layouts; *Microsoft Money*,™ to help you write checks, set budgets, track expenses; PLUS an *Entertainment Pack* with eight games, including *Tetris®*

Option #6- *The Windows Programmer Pack*

■ Includes everything you need to create programs for Windows: *Microsoft QuickC for Windows*™, *Windows Control Development Kit*™, *Windows Help Compiler*™ and *Windows Programmers' Online Reference*™.

Option #7-*Microsoft Project for Windows*™ *3.0*

■ Flexible and easy project management program

NOTE: If you would rather replace an option with *Microsoft Office*™, it is available for $175. This package includes *Word for Windows*, *Excel* and *PowerPoint*.

New! Second Applications At Great Prices!

The following applications are only available with the purchase of a system, pre-installed, or to Gateway customers.

Central Point® Anti-Virus 1.2 For Windows ■ $75

Central Point Backup™ 7.2 for Windows ■ $75

The Norton Desktop™ 2.0 and Prisma Your Way 2.0 For Windows ■ $95

These offers include the identical applications contained in retail packages but will not include the retail box. You get all master diskettes and manuals, shrink-wrapped and packaged in a Gateway 2000 box.

Peripherals

The 15-Inch CrystalScan 1572FS

You'll enjoy your new Gateway 2000 computer even more if you choose the new 15-inch CrystalScan color monitor option. The CrystalScan 1572FS has a flat, square, non-glare screen to reduce distortion around the corners and provide edge-to-edge display area.
The CrystalScan 1572FS is an upgrade option only with the purchase of a 386DX or 486 system for an additional $195.

The Gateway 2000 TelePath™ Fax/Modem

The Gateway 2000 TelePath is a 14,400 bps mode, V .32bis, with 9,600 bps fax capability. The TelePath comes with WinFax Pro,™ Crosstalk™ for Windows, Qmodem™ and a free 30-day basic services CompuServe® membership — all for only $195!

■ Fax mode: V.17, V.29 and V.27ter

■ Data mode: V.32bis, V.32, V.22bis, V.22, V.21, Bell 212A and 103, V.42 and MNP 2-4 error correction, V.42 bis/MNP 5 data compression

Included With Every System:

■ One-year limited warranty ■ 30-day money-back guarantee ■ Lifetime toll-free technical support ■ Free on-site service to most locations (*factory service only for notebooks*) ■ Free bulletin board technical support ■ C.O.D. terms and major credit cards honored ■ Net 30-day credit terms and leasing options available to qualified commercial customers

Sorry — we sell peripherals only with the purchase of a Gateway 2000 system, or to people who are already Gateway 2000 customers. For fastest service, call our new direct line for the ***Component Add-On Division: 800-252-3333.*** *Please have your customer ID handy when you call.*

GATEWAY2000
"You've got a friend in the business."

GATEWAY 2000 WINNERS CIRCLE

PORTABLES

HANDBOOK™

- 286 Class Performance
- 1MB RAM upgradeable to 3MB
- 40MB Hard Drive
- Backlit 7.6" CGA Screen
- Size 5.9" x 9.75" x 1.4", 2.75 Lbs.
- 4.5-Hr.* NiMH Battery & AC Pack
- 1 Parallel/1 Serial Port
- 78-Key Keyboard
- MS DOS® 5.0, File Transfer Software & Serial Download Cabl
- Introductory Bonus Pack
- Carrying Case

$1295

NOMAD 325SXL

- 25MHz, 386SXL Processor
- 4MB RAM
- 1.44MB 3.5" Drive
- 80MB IDE Hard Drive
- Backlit 10" VGA Screen, 64 Grays
- Simultaneous Video with 256K
- Size 8.5" x 11" x 1.8", 5.8 Lbs.
- 7-Hr.* NiCad Battery & AC Pack
- 1 Parallel/1 Serial Port
- 79-Key Keyboard
- FieldMouse™ Pointing Device
- MS DOS® 5.0 & Windows™ 3.1

$1995

NOMAD 420SXL

- 20MHz, Intel® 486SXLP Processor
- 4MB RAM
- 1.44MB 3.5" Drive
- 80MB IDE Hard Drive
- Backlit 10" VGA Screen, 64 Grays
- Simultaneous Video with 1MB
- Size 8.5" x 11" x 1.8", 5.8 Lbs.
- 6-Hr.* NiCad Battery & AC Pack
- 1 Parallel/1 Serial Port
- 79-Key Keyboard
- FieldMouse Pointing Device
- MS DOS 5.0 and Windows 3.1

$2695

NOMAD 425DXL

- 25MHz, Intel 486DXLP Processor
- 4MB RAM
- 1.44MB 3.5" Drive
- 120MB IDE Hard Drive
- Backlit 10" VGA Screen, 64 Grays
- Simultaneous Video with 1MB
- Size 8.5" x 11" x 1.8", 5.8 Lbs.
- 6-Hr.* NiCad Battery & AC Pack
- 1 Parallel/1 Serial Port
- 79-Key Keyboard
- FieldMouse Pointing Device
- MS DOS 5.0 and Windows 3.1

$3495

DESKTOPS

25MHz 386SX

- Intel 386SX Processor
- 4MB RAM
- 1.2MB & 1.44MB Drives
- 80MB 17ms IDE Cache Drive
- 16-Bit SVGA with 512K
- 14" CrystalScan 1024 Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 124-Key AnyKey™ Keyboard
- Microsoft® Mouse
- MS DOS 5.0 and Windows 3.1
- Choice of Application Software

$1495

25MHz 486SX

- Intel 486SX Processor
- 4MB RAM
- 1.2MB & 1.44MB Drives
- 120MB 15ms IDE* Cache Drive
- ATI™ Graphics Ultra Video
- 14" CrystalScan 1024NI Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS DOS 5.0 and Windows 3.1
- Choice of Application Software

$1895

33MHz 486DX

- Intel 486DX Processor
- 64K Cache RAM
- 4MB RAM
- 1.2MB & 1.44MB Drives
- 200MB 15ms IDE* Cache Drive
- ATI Graphics Ultra Video
- 14" CrystalScan 1024NI Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS DOS 5.0 and Windows 3.1
- Choice of Application Software

$2395

50MHz 486DX2

- Intel 486DX2 Processor
- 64K Cache RAM
- 8MB RAM
- 1.2MB & 1.44MB Drives
- 200MB 15ms IDE* Cache Drive
- ATI Graphics Ultra Video
- 14" CrystalScan 1024NI Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS DOS 5.0 and Windows 3.1
- Choice of Application Software

$2695

**Enhanced IDE with RIDE (Rapid Integrated Drive Electronics)*

50MHz 486DX2 EISA

- Intel 486DX2 Processor
- 128K Cache RAM
- 8MB RAM
- 1.2MB & 1.44MB Drives
- 340MB 15ms SCSI Cache Drive
- 32-Bit EISA SCSI Controller
- 16-Bit SVGA with 1MB
- 14" CrystalScan 1024NI Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS DOS 5.0 and Windows 3.1
- Choice of Application Software
- Tower Model is Standard

$3695

OTHER SYSTEMS

- Other systems in our product line: 16MHz 386SX, 20MHz 386SX, 25MHz 386DX, 33MHz 386DX, 33MHz 486DX EISA. Call for details and pricing.

** Battery life was measured using PC Magazine's Battery Rundown Test with power management enabled. Actual results may vary depending on configuration and applications.*

All prices and configurations are subject to change without notice. Prices do not include shipping. Components, peripherals and software are sold only with the purchase of a system, or to customers who already own Gateway 2000 systems. Some limitations apply.

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GATEWAY2000

"You've got a friend in the business."

GLOBAL RELEAF

800-523-2000

610 Gateway Drive • P.O.Box 2000 • North Sioux City, SD 57049-2000 • 605-232-2000 • Fax 605-232-2023

Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays (CDT)

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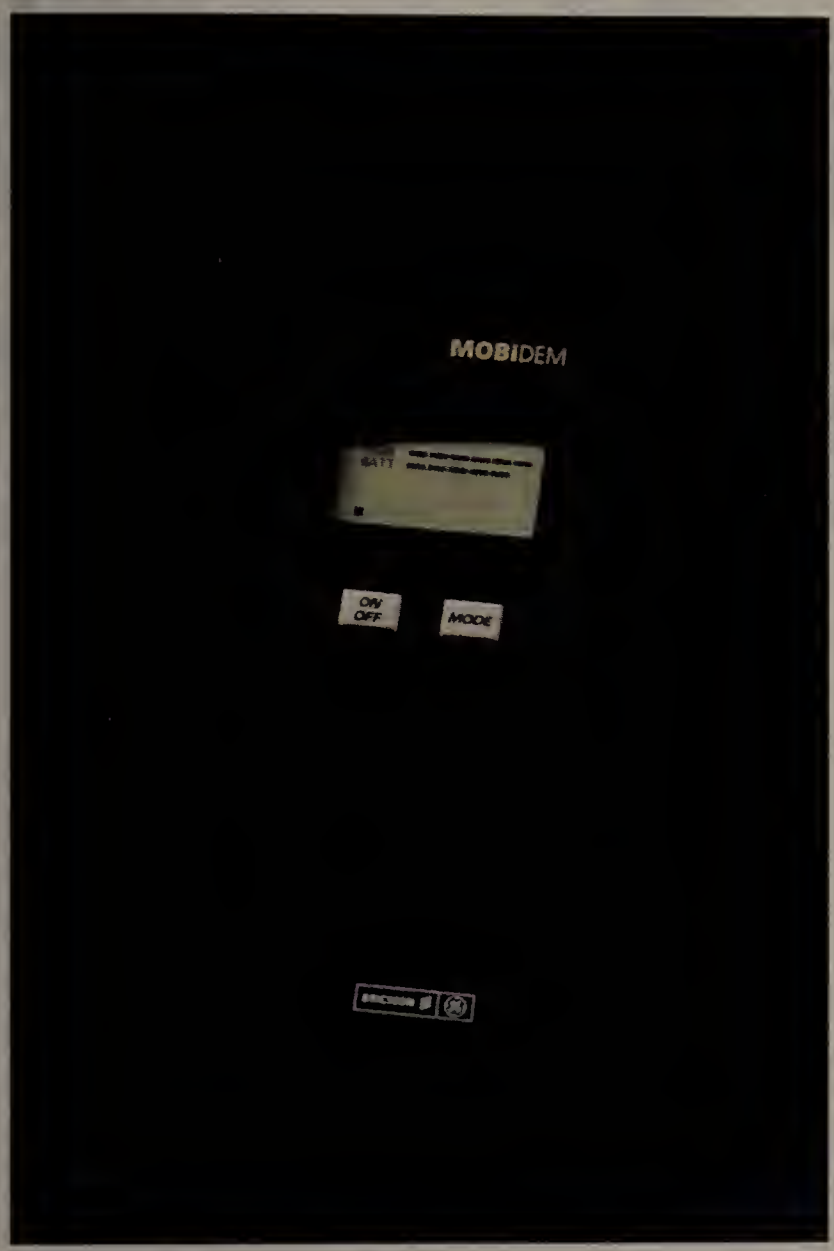
Wireless Communications Arrives

The Mobidem portable radio modem signals a new era of remote communications that promises to keep you linked to your office.



Ericsson GE's Mobidem is a 1-pound, portable, wireless radio modem that lets you send and receive E-mail.

Exchanging electronic mail on the road can seem as realistic as the paperless office if you and a phone plug never seem to cross paths. If most of your travel time is spent at airport terminals, in cabs rushing to and from meetings, or grabbing a quick bite in restaurants, you know how difficult it can be to find a mate for your modem.

Enter the Mobidem M1090 radio modem. Like a conventional external modem, this portable communications device from Ericsson GE Mobile Communications plugs into a standard PC serial port. But unlike conventional modems, it lets you exchange E-mail and computer files with no strings —or phone wires—attached.

Mobidem exchanges data via the Mobitex packet-switched data network, a joint venture of Bell South and Ram Broadcasting. Mobitex users are charged for each "packet" of data they send, with costs running about 25 cents per 1K of data. Currently Mobitex is available in only about 30 North American cities, but plans call for coverage of more than 100 cities by the end of 1993, according to Ericsson officials.

Despite its bulkiness (the Mobidem is the size of a walkie-talkie and weighs only 1 pound), the device is a model of simplicity. In addition to the fold-down antenna and rechargeable battery pack, the user has only two keys to worry about. One turns the unit on and off, and the other activates the Mobidem's power-saving mode.

With power saving, the unit will run for over 10 hours between charges. This mode causes the Mobidem to go into a "doze" state, while still regularly checking in with the local Mobitex base station to search for incoming messages. In this mode, your incoming messages may be delayed by as much as 30 seconds, but you should be able to send messages instantly. If you don't want any delay, the Mobidem's regular operating mode keeps it in constant communication with the base station. However, you can expect only 2 or 3 hours of battery life in that mode.

The Mobidem offers messaging capabilities not available with cellular modems. For example, upon receiving a message, the Mobidem beeps to alert you. If your PC is turned off or disconnected from the Mobidem, the radio modem stores your messages, and its LCD shows the number of messages waiting. Furthermore, if your Mobidem is turned off or out of network range, incoming messages are stored within the Mobitex network itself. Messages are automatically relayed to you as soon as you reconnect to the network.

Before you rush out and buy one, however, be aware of the Mobidem's drawbacks. First and foremost is the radio modem's $1795 list price (which Ericsson officials admit is too high—street prices should drop below $1000 in 1993, they predict. A better deal might be Ericsson's $1995 Viking Express package: a Mobidem unit bundled with the Hewlett-Packard 95LX palmtop PC. Included are a carrying case and Anterior Technology's *RadioMail Remote* software for sending and receiving E-mail using the Mobidem). Few software drivers for the Mobidem exist, and the unit's bulkiness makes it an extra burden for travelers with 6-pound notebooks.

With a data transmission speed of 8000 bits per second, the Mobidem is slower than the 9600-baud and 14,400-baud conventional modems that are steadily dropping in price. Ericsson is marketing the Mobidem as a wireless messaging tool and admits that users who transmit large files (like 40K of data) will likely find cellular transmission more affordable.

Despite its shortcomings, Ericsson GE's Mobidem M1090 hints at the future of remote communications. Along with competing wireless products, such as cellular modems and radio modems that use Motorola/IBM's Ardis network, the Mobidem shows where the future of computing is heading: through the air.

—Jeff Bertolucci

IN BRIEF

Mobidem M1090

A portable, wireless radio modem that lets you use your PC to send and receive messages.

Ericsson GE Mobile Communications, Inc.
15 E. Midland Ave.
Paramus, NJ 07652
201/265-6600,
201/265-9115 (fax)
Reader service no. 621

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quote, is easy t

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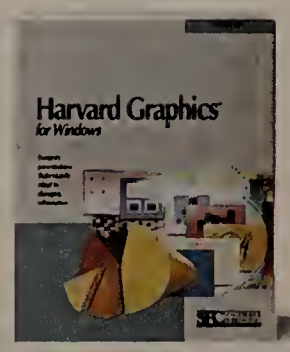
"...Harvard Windows promises to be a surefire hit with presentation novices and veterans alike."

— PC World 12/91

"Harvard Windows makes it easier than ever for you to produce 35mm slides, transparencies, printouts, and screenshows."

— PC World 12/91



free Harvard Graphics for Windows demo disk.

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Dial-Up E-Mail for Remote Users

A dial-up E-mail and file transfer system, PC-tPOST for Windows 1.0 stores messages on a central host station.

Even if you've never heard of *PC-tPOST*, you might consider the new *Windows* version if you're shopping for an E-mail system designed specifically for remote users.

PC-tPOST for Windows 1.0 is a dial-up E-mail and file transfer system that works much like dial-up services, but unlike a service, it's both private and less costly—once you have a modem and have installed the software, all you pay is the phone bill. The program can send and receive data with any E-mail and communications programs that use the XMODEM CRC file transfer protocol. Messages and files are stored on a central host station, and they can be accessed from anywhere. Likewise, the host can communicate with connected desktops or laptops to collect data files automatically.

By combining remote communications facilities with E-mail features and *Windows*, *PC-tPOST for Windows* lets remote users feel like they're in the office. The product incorporates most standard features of a solid E-mail program, and a full-on *Windows* interface. An optional fax-forward feature lets out-of-office users send a fax remotely.

Priced at $149 for a single-user version and $349 for the host, *PC-tPOST for Windows* is also available in a LAN version; a five-user license costs $495. The optional fax-forward feature is available for $149. If you've got remote users to worry about, this might just fit the bill. —*Bronwyn Fryer*

IN BRIEF

PC-tPOST for Windows 1.0

WINDOWS This electronic-mail and file transfer program for remote users features a slew of new E-mail features and a dressed-up Windows interface.

Coker Electronics
1430 Lexington Ave.
San Mateo, CA 94402
415/573-5515
Reader service no. 622

Take Control of Networked PCs

With Funk Software's *Proxy*, you can control up to eight networked PCs from a single *Windows* session. *Proxy* is aimed at LAN administrators installing and administering software on far-flung nodes and users lusting for the untapped power of idle computers.

Proxy has two components. The Master program runs under *Windows* on your PC and controls the remote unit. The Host program is a 60K TSR that runs on each remote system. *Proxy* is compatible with Novell's NetWare and most other LAN operating systems.

To take control of another PC, use the *Proxy* interface to choose a host workstation. *Proxy* makes the connection and displays the remote PC's screen in a window. You'll have mouse and keyboard control over the remote unit. While *Proxy* can run either DOS or *Windows* apps remotely, you'll have to load special drivers on each host system to run *Windows* programs.

You can simplify the linking procedure by creating *Windows* icons that automatically load *Proxy* and connect your PC to a remote unit.

Proxy costs $395 and supports one master and five host PCs. Support for five additional hosts costs approximately $225. —*Jeff Bertolucci*

IN BRIEF

Proxy

WINDOWS This Windows-based package lets you control up to eight networked PCs at once.

Funk Software
222 Third St.
Cambridge, MA 02142
617/497-5210,
617/547-1031 (fax)
Reader service no. 623

An Executive's Group Scheduler

Finalsoft Executive for Windows is a combination group scheduling, E-mail, and text editing program. The product includes a personal scheduler with a to-do list. The group scheduler gives you a graphical view of your colleagues' available time slots for a proposed meeting. There are even shades of project management in this package: You can see your colleagues' to-do lists (with their permission) and assign tasks. Since the scheduler is tightly integrated with the E-mail module, you don't have to send a separate message to confirm a meeting—the program does it for you.

You can send messages, attach files, send carbon and blind copies, and fill out "While You Were Out" forms about phone calls. To fire off a memo or letter, just use the built-in text editor and click a button to mail it off; a hypertext link lets you attach files. A built-in *dBASE*-compatible data base lets you set up an address book of contacts.

LAN versions of *Finalsoft Executive for Windows* start at $445 for six users. By combining personal and group scheduling with E-mail and *Windows*, the product blends the best of all worlds.

—*Bronwyn Fryer*

IN BRIEF

Finalsoft Executive for Windows

WINDOWS A personal and group scheduler combined with E-mail, text editing, and data base features gives you an all-in-one communications package.

Finalsoft Corp.
3900 N.W. 79th Ave. #230
Miami, FL 33166
800/232-8228,
305/477-2703
Reader service no. 624

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Behold the new Toshiba T4400SX notebook—the first 486SX computer to offer all the power and performance of a desktop computer while freeing you from the tyranny of the nearest electrical outlet.

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You can use our credit card-sized memory modules to expand standard 2MB RAM to 18MB for added speed and multi-tasking capabilities.

The T4400SX is the only notebook computer that offers a high-speed Gas Plasma screen, which means no mouse blur. And its 100:1 contrast ratio delivers seven times the contrast of a typical LCD display.

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Both offer a 640 x 480 VGA high-resolution display as well as the graphic versatility of 16 gray scales for the gas plasma screen and 64 gray scales for the LCD screen.

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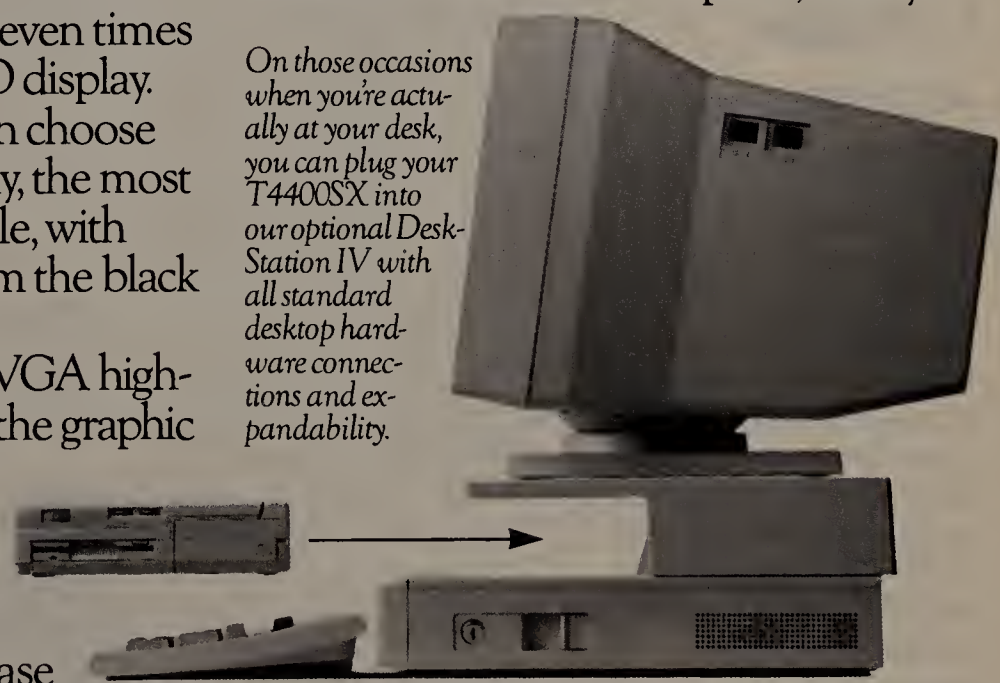
If you'd like to know more about the T4400SX notebook computer, or any of our full line of Toshiba portables, call us at 1-800-457-7777.



On those occasions when you're actually at your desk, you can plug your T4400SX into our optional Desk-Station IV with all standard desktop hardware connections and expandability.

We'll send you information that can lead to only one conclusion about desktop computers:

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TOSHIBA

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One-Write Plus 3.0

Meca Software has introduced its first major upgrade to *One-Write Plus* since acquiring developer Great American Software last January. Version 3.0 of the popular small-business accounting package includes a detailed general ledger for a more complete audit trail, a prior-year comparative income statement, and on-the-fly account setup. Version 3.0 sells for $129.95; current *One-Write Plus* users can upgrade for $69.95. *One-Write Plus 3.0* requires DOS 3.1 or a later version (3.3 or later is recommended), 640K of RAM, and a hard drive. Meca Software, 55 Walls Dr., Fairfield, CT 06430-0912; 800/388-8000.

Reader service no. 625

AutoCAD Release 11 Extension for Windows

WINDOWS If you've resisted learning *AutoCAD* because of its reputation for having a learning curve as steep as San Francisco's hills, you'll be pleased to see that Autodesk is helping you scale new heights with its new *AutoCAD Release 11 Extension for Windows.* This $99 product makes the *AutoCAD Release 11* package that you already have work under *Windows 3.0* or *Windows 3.1.* Its pulldown menus, customizable tool bar, and familiar *Windows* interface all straighten the learning curve considerably. The move to 16-bit *Windows* means you lose the advantages of *AutoCAD*'s 32-bit architecture but gain DDE capabilities. Say you need a parts list for your *AutoCAD* design. With DDE, you can export the relevant data to an *Excel* spreadsheet. Change the length of a pipe in your spreadsheet, and the change is reflected in your drawing. Or you can illustrate word processing or desktop publishing documents with *AutoCAD* drawings by cutting and pasting via the Clipboard. Autodesk, Inc., 2320 Marinship Way, Sausalito, CA 94965; 415/332-2344.

Reader service no. 626

Waves

WINDOWS Offices can be so straitlaced. But you can bang, bark, belch, boing, boink, or doink, giggle, yelp, or yipe, and escape personal responsibility—if you have Vitesse's new sound package for *Windows. Waves* adds a floppyful of barnyard, bodily function, and TV sounds—more than four dozen in all—to the "tada, ding" and other waves you get by upgrading to the multimedia PC–compatible *Windows 3.1.* Start up *Windows* to the sound of a rooster or a cavalry charge, or insert sound icons in OLE-compatible application files. This $29.95 program works with all popular soundboards and comes with a PC Speaker driver for the non–MPC equipped. Go ahead and baa-a-a, quack, or puke; your co-workers will blame the guy next to you using the Mac. Vitesse, Inc., 13909 Amar Rd. #2, P.O. Box 929, La Puente, CA 91747-0929; 800/777-7344, 818/813-1273 (fax).

Reader service no. 628

Twinhead Slimnotes

These slim-jims weigh under 6 pounds and measure 8.5 inches long, 11 inches deep, and 1.7 inches thick. And they've got power, too. The Slimnote 486DX/33 comes with an 80MB hard drive, 4MB of RAM (expandable to 20MB), a 3½-inch floppy drive, and DOS 5.0 and costs about $3199. The 486SX/20 model has the same features and costs about $2699. The 386SXL/25 comes with 2MB of RAM (expandable to 6MB) and a 60MB hard drive and costs about $1999. Useful features include simultaneous LCD/CRT video output, an optional $129 trackball, and about 3 hours of battery life with the power management features disabled. The Slimnotes' array of ports includes the usual serial, parallel, external video, and keyboard ports, plus a 100-pin expansion port for connecting external peripherals such as printers and CD ROM drives. Twinhead Corp., 1537 Centre Pointe Dr., Milpitas, CA 95035; 800/545-8946, 408/945-0808.

Reader service no. 633

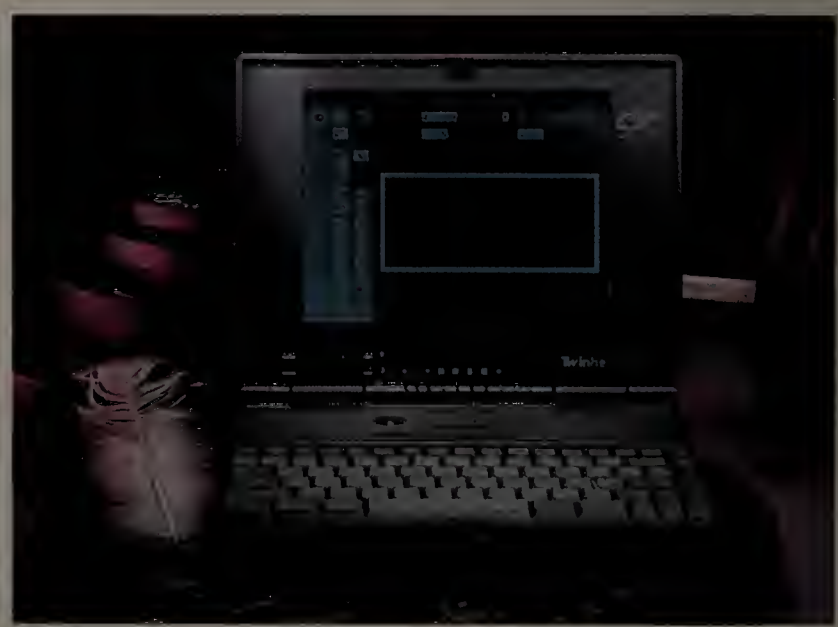
MoneyCounts 7.0

Current users of Parsons Technology's *MoneyCounts* personal finance package will notice a whole new look and feel to version 7.0. The program now sports a checkbooklike interface, pulldown menus, pop-up lists, push buttons, and mouse support. The many new features let you create multiple sets of books for home and business accounts and subtotal accounts in any combination; support single- and double-entry accounting methods; and offer a notes field for all transactions among other things. In a departure from the traditional requirement for standard, preprinted checks, version 7.0 will print on any size check that you can feed into your printer. *MoneyCounts 7.0* sells for $49. Current *MoneyCounts* users can upgrade for $24.50, or $5 if they purchased the package after November 1, 1991. Parsons Technology, One Parsons Dr., P.O. Box 100, Hiawatha, IA 52233-0100; 800/223-6925.

Reader service no. 630

Pacioli 2000 2.0

M-USA Business Systems has introduced version 2.0 of *Pacioli 2000,* the package that shook up the small-business accounting market two years ago with its full feature set and rock-bottom price of $49.95. Version 2.0 features a simplified chart of accounts, support for recurring entries, import/export and account balance consolidation, an improved report generator, and support for up to three different taxing authorities, such as city, county, and state taxes, in the same table. *Pacioli 2000 2.0* sells for $49.95, which includes out-of-the-box network support and a 30-day money-back guarantee. Current *Pacioli 2000* users can upgrade for $25; users of any



Twinhead's 6-pound notebook uses a 33-MHz 486 CPU and promises 3 hours of battery life.

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Now there's a complete Uninterruptible Power Supply solution to suit any budget. The Back-UPS™ 250 is reliable protection for LAN nodes, 386SX machines, 286, small PS/2 systems, and internetworking hardware such as routers, bridges, gateways and repeaters.

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The **Back-UPS 250** offers even more cost-effective protection for LAN nodes (typical runtime for a 386SX system is 10 minutes).

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- ABSOLUTE™ Protection guarantees repair or replacement of equipment damaged by a surge while protected by a properly installed Back-UPS (Consult APC for details)
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LAN TIMES READERS CHOICE 1992 — 1991, 1990

Computer Reseller News Editors' Choice

Model	Application	List	New List
Back-UPS 250	LAN nodes, 386SX, 286, internet hardware, POS	~~$169~~	$139
Back-UPS 400	Desktop 386, 486 systems, 286 servers	~~$249~~	$229
Back-UPS 450	Tower 386, 486 systems, servers	~~$329~~	$279
Back-UPS 600	Heavily configured systems, CAD/CAM workstations	~~$449~~	$399
Back-UPS 900	Multiple systems, longer runtime applications		$599
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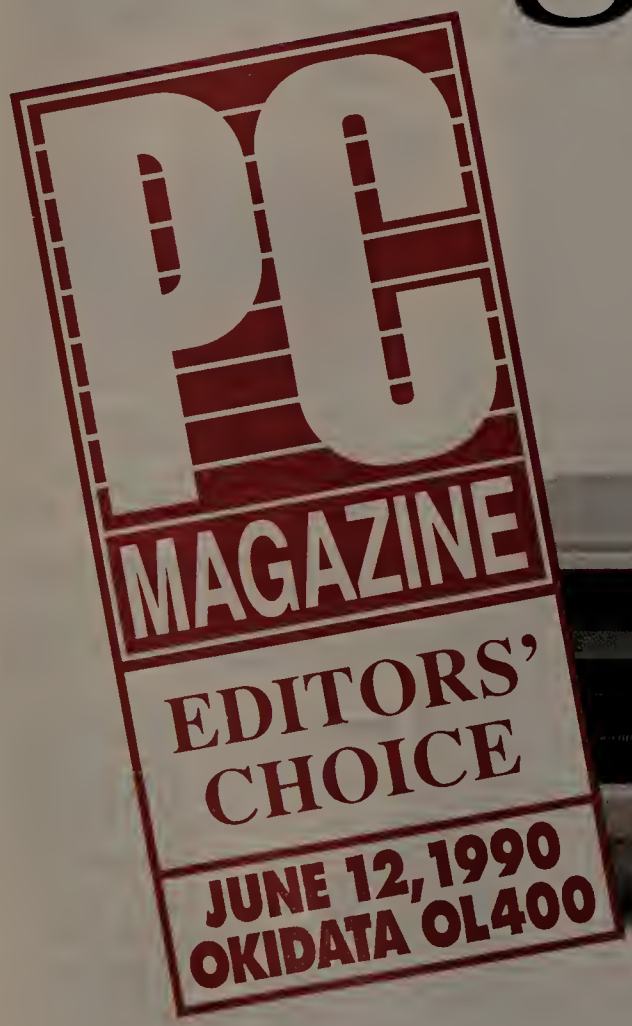

OL400

4 PPM

In June 1990, Okidata's OL400 personal page printer won a PC Magazine Editors' Choice award. The editors praised its overall performance and value – applauding its graphics and text quality, and its wide selection of built-in typefaces and fonts. All at the lowest suggested list price of any page printer available.

In November 1991, Okidata's new OL830 Adobe® PostScript® printer won the same coveted award. Once again, the editors praised our printer's overall performance and value. They found it to be the fastest of *all* 8-ppm printers tested in PCL (HP emulation) graphics mode. And considering its record-setting low price, they rated it "the best inexpensive PCL/PostScript printer available".*

leads to another.

OL830

8 PPM

Both printers come equipped with an impressive list of standard features – including full HP Series II software compatibility, and the industry's only 5-year printhead warranty. Plus a choice of options to tailor either machine for your specific business or home-office application.

And both come with one additional standard feature: the Okidata OK! It's our pledge to you that every product bearing our good name will deliver not just acceptable, but outstanding performance and value.

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Circle 199 on reader service card

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ACT PLUS provides the comprehensive business software needed to run successful businesses.

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"We took out our old system a year ago and installed Act Plus. We use Act Plus all day long. It's the best software for business that I've ever run across." — Alumaline Corp. of America

"After evaluating several others — even some costing over a thousand dollars — we chose Act Plus because of its superb accounting, full integration and flexibility. It easily handles our retail and wholesale operations and our multiple locations. And we've sure cut down on our CPA and tax preparation costs." — Vertek, Inc.

"We looked at several other packages, but when we found Act Plus we didn't have to look any further. It's fast, flexible and easy to use. I'd recommend it to anyone." — Water Sport Marine and Ski

In the 10 years we've been developing Award Winning business software we've become experts in solving business accounting challenges: Act Plus Version 8.2 is the most powerful, cost-effective product on the market. Like our cougar, it's fast, flexible and sharp.

Act Plus Version 8.2 has all the capabilities that are important to owners, managers, accounting personnel, sales people, financial advisors, and tax accountants. We guarantee that Act Plus is your best value in flexible and powerful accounting software.

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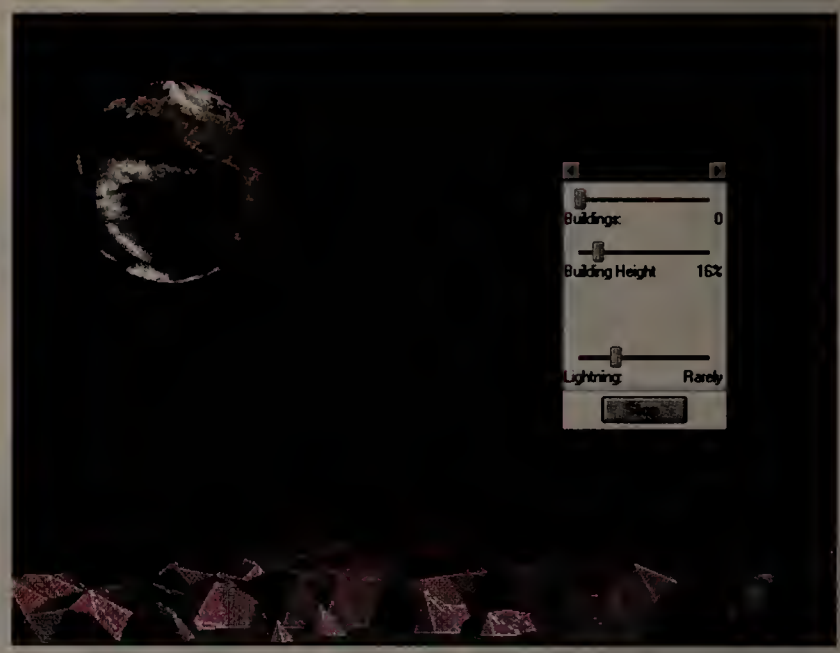

From lunar vistas to lowly coyotes, After Dark 2.0 provides colorful and imaginative screen savers and Windows backgrounds.

other accounting packages can make the move to *Pacioli* for $29.95 in a competitive upgrade offer. *Pacioli 2000 2.0* requires 640K of RAM, a hard disk, and DOS 2.1 or a later version. M-USA Business Systems, Inc., 15806 Midway Rd., Dallas, TX 75244; 800/933-6872, 214/404-1957 (fax).

Reader service no. 631

Gulliver

Want a mouse that's small enough to stash in your coat pocket and use with your notebook on the road? Appoint's new mouse, Gulliver, is about half the size of a Microsoft Mouse and features a built-in suspension system that keeps the ball rolling on just about any surface—even your sleeve or the underside of an airplane seat tray. Your fingers won't have to grope for the primary button, which wraps around this rodent's nose. You get a standard second button and a third button that enables you to lower the resolution for drawing. Gulliver connects to serial ports or PS/2 ports and has a list price of $99. Appoint, Inc., 7026 Koll Center Pkwy. #230, Pleasanton, CA 94566; 800/448-1184, 510/417-0614 (fax).

Reader service no. 627

After Dark 2.0

WINDOWS The latest version of this screen saver/wallpaper utility includes colorful new displays for use as a *Windows* background or to protect your screen from burn-in when it's not being used. You can mix different screen effects side-by-side or overlapped and digitized sound capability has been added to many screens—howling coyotes, fish tank bubbles, and more. *After Dark 2.0* supports Sound Blaster and other multimedia boards, but they're not required for the sound effects. *After Dark 2.0* even blanks DOS screens to protect them from phosphor burn-in, but its colorful displays require *Windows 3.0* or a later version and a VGA or better monitor. The program retails for $49.95. Upgrades are $15. Berkeley Systems, Inc., 2095 Rose St., Berkeley, CA 94709; 510/540-5535.

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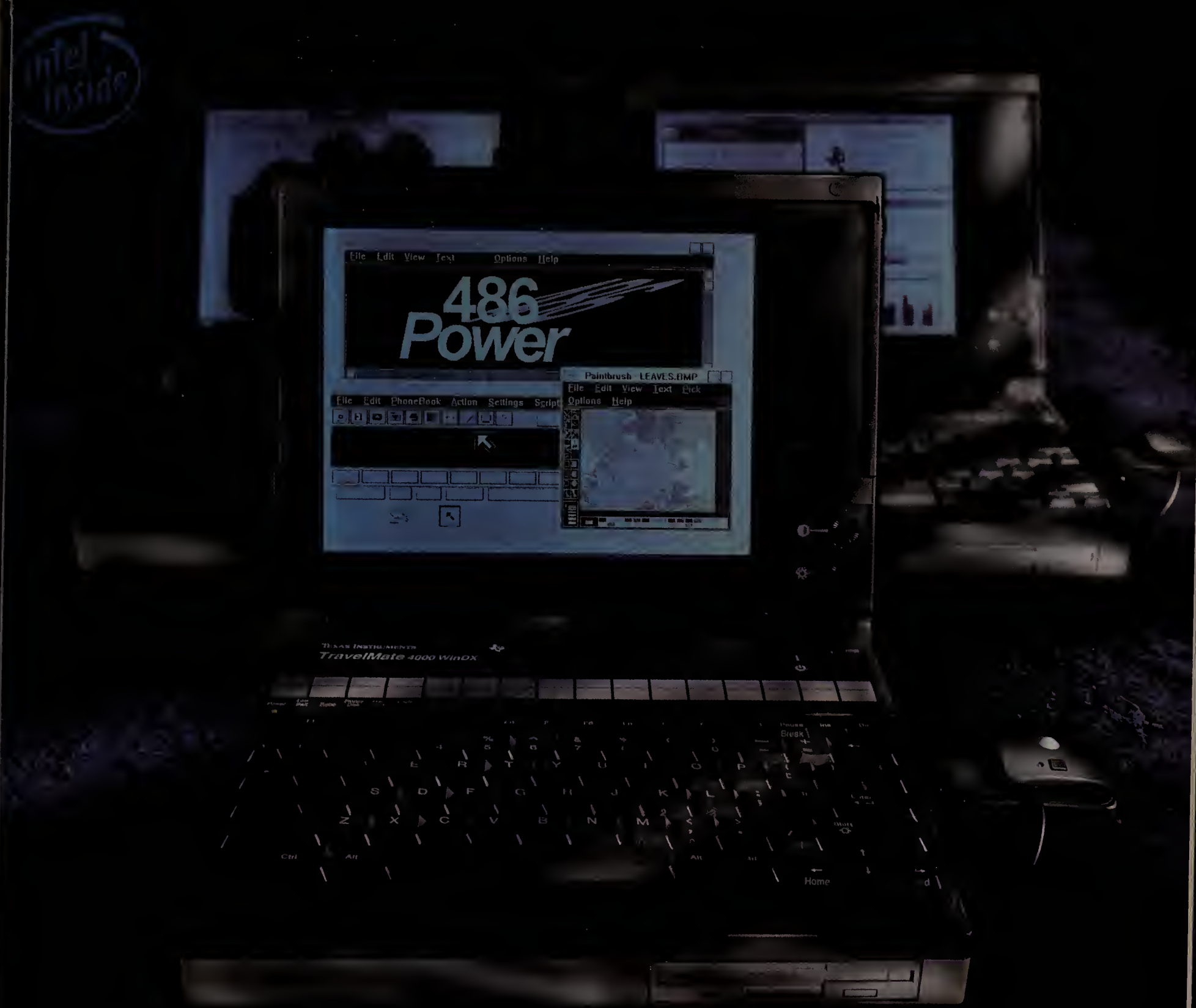
Bar_Lite automatically attaches U.S. Postal Service Postnet bar codes to all letters and envelopes created with DOS-based word processing, accounting, or data base programs. The program



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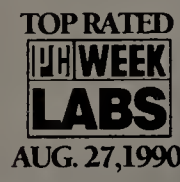

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Reader service no. 636

Personal Access 1.5

WINDOWS Designed for corporate end users, *Personal Access* is a software tool that simplifies data access from a variety of data bases. Version 1.5 features an improved interface for simpler and faster query processes, and an on-line tutorial that guides users through query and reporting functions—from creating a simple query to working with tables and executing complex queries and reports. *Personal Access 1.5* now supports *Paradox* as well as all major data bases, including *Oracle*, Microsoft's *SQL Server*, Sybase's *SQL Server*, *dBASE*, and Novell's *Btrieve*. It costs $695. Upgrades are free. Spinnaker Software Corp., 201 Broadway, Cambridge, MA 02139; 617/494-1200, 617/494-0173 (fax).

Reader service no. 635

Accel-a-Writer VIII

If you're tired of waiting for your LaserJet to print, you might take your queue from Xante's new Accel-a-Writer VIII. This upgrade controller for the HP LaserJet Series I printer uses an AMD 29000 RISC processor to increase printing speeds as much as 12 times and is available in either 300-dpi or 600-dpi models. The Accel-a-Writer VIII uses Phoenix Page emulation language for PostScript compatibility, includes 35 resident fonts, and can hold up to 16MB of RAM. In addition to parallel and serial ports, it has an AppleTalk interface, so you can print simultaneously from a PC and from a Mac. Also included is a SCSI port for attaching an external hard drive to store additional downloaded fonts. The 300-dpi controller (upgradable to 600 dpi) is priced at $1295 and the 600-dpi controller costs $1695. Xante Corp., 2559 Emogene St., Mobile, AL 36606; 800/926-8839, 205/476-8189, 205/476-9421 (fax).

Reader service no. 639

Personal LaserWriter NTR

Yes, Virginia, Apple makes products for *Windows* users. Not only does Apple's new Personal LaserWriter NTR feature LocalTalk, parallel, and serial ports, it also has an "all ports active" design that enables networked Macintosh and *Windows* users to send documents to the NTR without changing DIP switches or other settings. Priced at $2199, the NTR includes 3MB of RAM (expandable to 4MB) for fast printing and enough room for downloading fonts, as well as Adobe PostScript Level 2 and PCL 4+ page description languages. Apple has further boosted the Personal LaserWriter NTR's performance by placing the TrueType font-scaling technology and Adobe's Type 1 font software in ROM. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014; 800/776-2333.

Reader service no. 634

For more information about any product, contact the manufacturer or circle the number on the reader service card.

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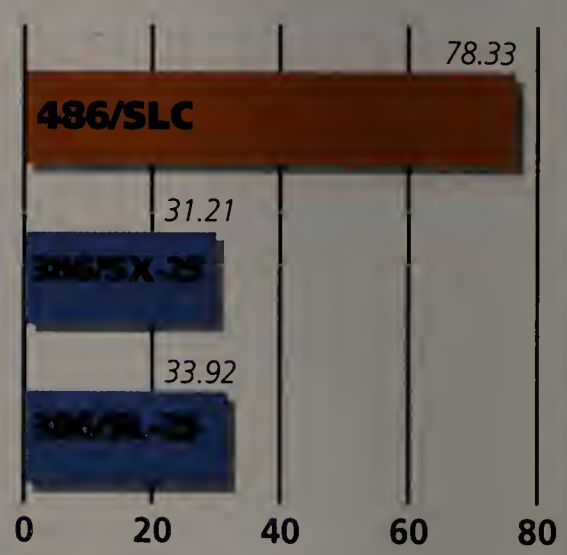

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Edited by ERIC BENDER

New Compaq Aims to Crunch Clones

Buyers Will Give Embattled Giant a Chance—If the Price Is Right

Mention Compaq to a PC buyer, and the first response is "expensive." But the beleaguered Houston manufacturer just pulled out all the stops to change that perception—and position itself for the low-margin 1990s.

Compaq's new ProLinea desktops begin at about $900 for a 25-MHz 386SX model, and Contura 386SL notebooks start under $1700 (see "Compaq Gets Budget Minded"). At these prices, Compaq is getting serious about attracting the small-business and home users who have always considered the company's PCs to be too pricey.

This group, which often buys through the mail or low-margin retail outlets, is quite different from Compaq's traditional Fortune 500 clientele. In fact, "unless you're an experienced PC user, you may not know who the heck Compaq is," says Bruce Stephen, analyst with International Data Corporation in Framingham, Massachusetts.

One key for success on this new turf will be "hiring new people who bring a merchandising background," says Stephen. Other analysts speculate that like IBM with the PS/1, Compaq may have chosen the right pricing and channels for these users, but underestimated their need for power and expandability.

Compaq is also covering its traditional bases by rolling out the Deskpro/i line of inexpensive slimline desktops with fast video and built-in audio. And it has added a one-year on-site service contract for all products plus a grab bag of new support programs.

Compaq Rebuilds Its Line

Product line	Entry list	Target market	Positioning
Prolinea	$899	small business/home	low-cost PCs with limited upgrades
Deskpro/i	$1779	business, low end	introduces Business Audio, QVision
Deskpro/M	$2269	business, high end	Compaq's improved flagship line
Systempro	$4999	network server	reduced prices, market leader
Contura	$1699	traveler, low end	inexpensive notebooks
LTE Lite	$2399	traveler, high end	includes $5000 color model

Compaq is rounding out its product line with PCs that compete aggressively on price versus Dell and AST.

Taking a Lower Road

These dramatic steps all stem from a thorough battering in the past year for what was once the highest of PC highfliers.

Unable to keep up with the rapid price cuts throughout the PC industry, Compaq saw sales and profits sag last fall. It replaced its chief executive, laid off employees, cut costs internally, and began to turn things around. Still, first-quarter sales of $783 million were down 19 percent from the same period last year, while income dropped 60 percent to $45 million.

New chief executive Eckhard Pfeiffer expects to post low earnings through the year as Compaq increases spending to roll out its entry-level PCs. Earnings also will be cut by company expansion beyond its traditional dealer distribution channel—perhaps even into direct mail.

Users: The Price Better Be Right

For most users, the key concern remains simple: cost.

Lower Compaq prices are "only going to keep us loyal," says Brian Cordell, operations systems analyst for First Bank in Minneapolis, who buys mostly 25-MHz 386DX desktops from Compaq. "People are willing to pay a small premium for the Compaq name, but they're not willing to pay a large premium."

Volume buyers like First Bank get steep discounts. Small businesses like Fritz Companies, a San Francisco transportation firm, don't. That's why Jim Liefer, Fritz's PC buyer, switched to Dell Computer and Zeos International for stand-alone PCs. Liefer says he will reevaluate Compaq if its revamped prices prove competitive.

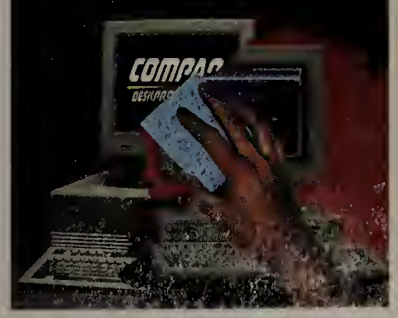
"I might consider them for a server," says Sandi Graham, network supervisor for Franklin Federal Bancorp in Austin, Texas. Graham notes that one of Franklin's two Compaq servers hasn't needed repairs since it was purchased three years ago, but she believes she can find a better deal elsewhere for net workstations or stand-alone PCs.

Some users also complain about the expense of upgrading Compaq systems—in particular, the requirement for expensive proprietary memory modules. Compaq replies that all its newer PCs employ industry-standard SIMMs—another example of how it's now listening to customers.

—Jeff Bertolucci

Compaq Gets Leaner—And More Competitive

- Low-cost products, price reductions on existing lines
- New management, internal cost cutting, employee layoffs last fall
- Expansion into new distribution channels, possibly including direct sale
- Big push on service and support, including on-site repairs



Stung by last year's declining sales and profits, Compaq has regrouped for a comeback. Its goal is to expand its worldwide market share far beyond the current 5 percent level.

DOS Applications Still Dominate

Major Upgrades With Graphical Enhancements Will Arrive Soon

The rumors of DOS's demise have been greatly exaggerated.

Microsoft may be pumping out a million copies of *Windows* every month, but DOS applications still outsell their *Windows* counterparts by a wide margin. While the gap is narrowing as businesses adopt new graphical environments, analysts expect DOS applications to remain strong well into the nineties.

And while few new mainstream applications are being written for DOS, major software developers are readying upgrades of their DOS flagships with graphical enhancements and features first seen on their *Windows* cousins.

DOS's Staying Power

Millions of PC users have yet to be swayed by the promised ease of use and graphical savvy of *Windows* applications. "It's unclear what *Windows* does for a data entry clerk," points out Jeffrey Tarter, publisher of *Soft•letter* in Watertown, Massachusetts.

Many large corporations planning to go graphical are treading cautiously due to the huge costs of upgrading machines, training users, and handling glitches in the new environment.

Richard Jacobson, a PC technician and analyst for Hormel Foods in Austin, Minnesota, is part of a team evaluating *Windows* and OS/2. "We're looking at over 600 machines we have to upgrade," Jacobson notes. "We have to make sure that OS/2 or *Windows* is stable enough to justify the cost of switching."

Other organizations are taking a *Windows*-on-demand approach, outfitting new machines with the environment and upgrading existing users as they request it. But one MIS manager at a midwestern aerospace firm reports that only one of every four users who request *Windows* sticks with it. "They want the fastest way to do the job," he says, "and unless you're working in a presentation-oriented environment, it's always faster to do it in DOS."

Old DOS, New Tricks

All of this adds up to a healthy DOS application market for established vendors.

"We don't see a world where everything converges on *Windows*," says Jeffrey Beir, vice president of Lotus's spreadsheet division. "Our goal is to bring the usability of the *Windows* world back to DOS." Last spring's *1-2-3* version 2.4, for example, sports the SmartIcons and Solver first seen in Lotus's *Windows* and OS/2 offerings. Lotus promises a built-from-scratch graphical DOS line by early 1993.

Also this fall, WordPerfect is expected to deliver a major upgrade of *WordPerfect* for DOS. Dave Moon, senior vice president of development, says the plan is to offer similar functionality and compatibility across DOS, *Windows*, and other platforms.

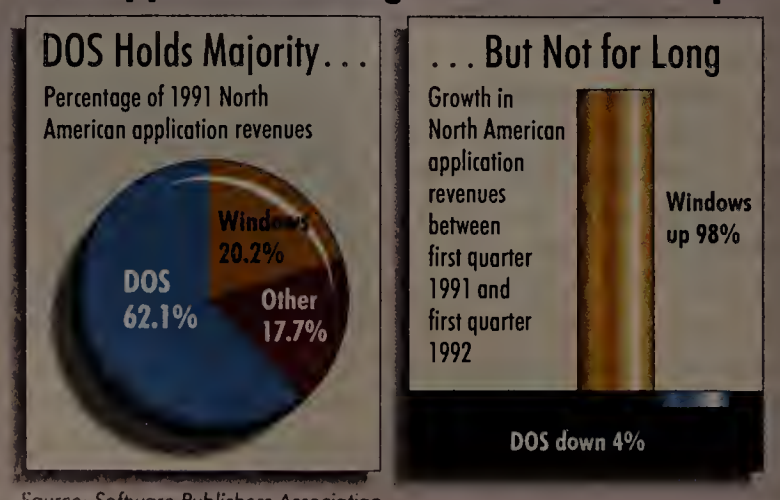
At press time, Borland International was preparing to ship *Windows* versions of its *Quattro Pro* spreadsheet and *Paradox* data base manager. But major rewrites like *Paradox 4.0* for DOS show that Borland is far from abandoning its DOS roots. "We think a lot of shops will have mixed *Windows* and DOS for some time," says senior vice president Rob Dickerson.

Even Microsoft acknowledges that the world is not entirely ready for *Windows*. "DOS is alive and well, and *Word 6.0* is in full development," says Taylor Collyer, product manager for Microsoft's DOS and OS/2 word processors.

As spiffy as the new DOS upgrades may be, they still will yield important ground to their *Windows* kin. They won't enjoy the same tight connections with other applications. Their interfaces won't be as rich. And if they stay within DOS's conventional-memory constraints, they'll have to give up some features and be satisfied with slower performance on large graphics files.

Still, many users will remain faithful to their DOS standbys. "If a DOS product does everything you need it to do, there's momentum to stay with it," says Teri O'Neel, a marketing director for Software Publishing Corporation in Santa Clara, California. "Nothing is as easy to use as something you already know."

—Daniel Tynan



DOS packages hold on to clear leadership in PC applications.

They'd Rather Fight Than Switch

DOS advocates sound off on America Online

"DOS applications are faster, smaller, and you don't need to spend six months learning the operating system just to make 'em run without crashing every 5 minutes."

"Using those nifty little icons in *Windows* can involve more of a learning curve than a totally new interface with a DOS program. I get calls from users who say 'There's this button that looks like a duck. What does it do?'"

"The basic idea behind *Windows*—to remove the user from the command language—is a positive and necessary move in the current PC market, but I'm convinced that DOS programs can fit the bill just as easily as GUIs."

"I have both *WordPerfect 5.1* and *WordPerfect for Windows* on my home system, but I use the DOS one. I'm familiar with it and can get my work done efficiently."

Many users find compelling reasons to stay with their familiar DOS applications.

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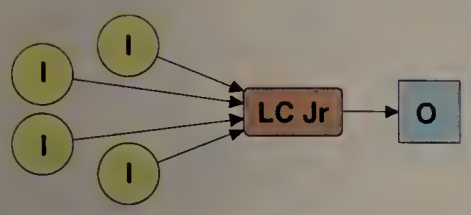

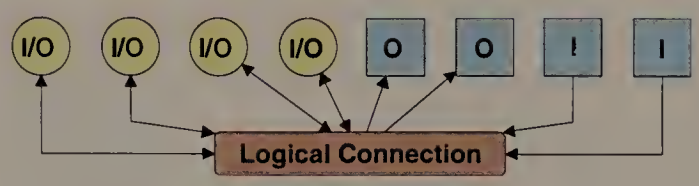

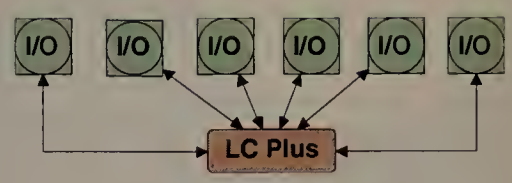

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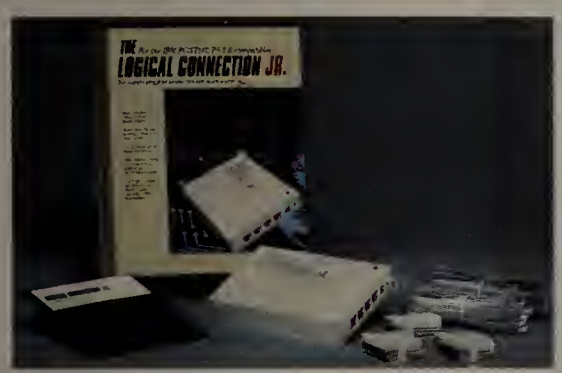
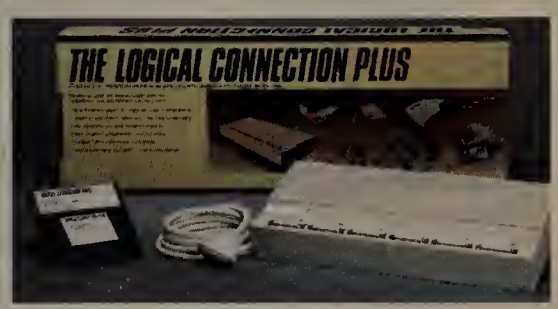
LC Plus-512Kb $695

All six ports of the **Logical Connection Plus** are automatically configured as parallel or serial, and input or output. Versatility and high speed are key features.





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Memory Module	EPC-6000	6 Mb	

Toshiba Laptop Models: (User may install)

1000SE/XE/LE, 2000, 2000SX
2000SXE, 2200SX (exclude 1Mb)

Memory Card	RCT-1000	1 Mb	call
Memory Card	RCT-2000	2 Mb	
Memory Card	RCT-4000	4 Mb	
Memory Card	RCT-8000	8 Mb	

PC-MCIA 2.0 / JEIDA SRAM (User may install)

For Laptops conforming to this new universal spec.

Memory Card	RJB-0512	512 Kb	call
Memory Card	RJB-1000	1 Mb	
Memory Card	RJB-2000	2 Mb	

Circle 126 on reader service card

Mail-Enabled Software Advances

As Vendors Battle Over Standards, Users Forge Ahead

Some day you'll be able to fire off an E-mail message to any co-worker anywhere from within any application, or easily write routines that automatically forward data from one application to another across your network.

Some advanced users have found ways to implement some of this today, but the promise of painless, full-featured E-mail won't be realized until major E-mail and application vendors settle their territorial disputes and cooperate on a common messaging backbone.

A handful of mail-enabled applications from major vendors are already out—including *Windows* programs from Lotus that offer a menu choice for Lotus's E-mail offerings. Stand-alone packages such as Microsoft's new *Schedule+ for Windows* group scheduler also build on mail. And in-house programmers are starting to create custom mail-enabled applications for high-payoff tasks such as collecting information from branch offices.

But commercial and in-house developers alike need a standard application programming interface (API) before they can write a mail-enabled application that works across all mail systems—and vendors disagree on APIs.

Microsoft pushes its *Windows*-centered Mail Application Programming Interface (MAPI). Lotus has enlisted Borland, IBM, Novell, and Apple to support its Vendor Independent Messaging (VIM). Novell and Apple also promote alternative standards built into their operating systems.

"I've listened to the vendors argue, and it was like, 'We've agreed that we'll make a mess here,'" says Vitro's Thomas Miceli.

STEVEN FALK

Who's Got the Standard?

Microsoft won't discuss the possibility of adding VIM support to *Windows* or other Microsoft products.

"We think VIM has a great deal of support," counters Tim Dempsey, manager of developer relations for Lotus's Communications Products division. Still, he concedes, "maybe there isn't going to be only one API."

Customers would like to see Microsoft "support a larger industry standard, like VIM," says Borland's Ken Einstein, director of applications strategy, who adds that Borland will support whatever standards users request.

WordPerfect also will keep its options open: "We're going to run on top of all of them," says Dave Clare, head of development for *WordPerfect Office*.

Just Do It

Confusing, isn't it? "I've listened to the vendors argue, and it was like, 'We've agreed that we'll make a mess here,'" says Thomas Miceli, a systems analyst for Vitro Corporation in Mechanicsburg, Pennsylvania.

The good news, according to users like Miceli, is that customers need not wait for the dust to settle. With some creativity, *cc:Mail*, *Microsoft Mail*, MHS (which comes bundled with *NetWare*), and other mechanisms are already up to the task.

Among the pioneers was the nationwide auditing firm of Deloitte & Touche, which used *cc:Mail*'s message import/export utility to build a distributed data base application that lets branch offices register employees for training courses. "Registrars at each office enter information in a *Clipper* application," says LAN services manager Larry Quinlan. "That program calls the *cc:Mail* import utility, sending the registration records to the main data base in the central training office via E-mail messages. But the registrars never see anything but *Clipper*."

At Tokos Medical Group in Santa Ana, California, "we need up-to-the-minute records at all our locations, 24 hours a day," says Project Manager Tony Roza. "Previously, nurses faxed charts between sites. Switching to network data bases at each office and using [an MHS-based application] to keep them in sync gives us faster updates and reduces costs by eliminating the time spent pulling charts, searching for files, and faxing information."

—*Robert Lauriston*

Daniel Tynan and Robert Lauriston are contributing editors for PC World.

The Battle for E-Mail Standards

Major players push their favored E-mail interface

Company	E-Mail products	Favored interface	Installed base
Apple	none	OCE, VIM	none
Borland	none[1]	VIM	none
IBM	none[2]	VIM	none
Lotus	cc:Mail, Lotus Notes	VIM	2,000,000
Microsoft	Microsoft Mail	MAPI	1,500,000
Novell	MHS, NetWare, Global Messaging (gateways)	MAPI, SMF, VIM	none
WordPerfect	WordPerfect Office	all	800,000

[1] Future mail-enabled Paradox will compete with Lotus Notes.
[2] Endorses cc:Mail and Lotus Notes.

Mail-enabled applications promise to remap the way you share information across your organization—but vendors don't agree on a standard way for applications to hook into E-mail.

WHY TAKE CHANCES?

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2 YEAR WARRANTY! ALL SYSTEMS

FEBRUARY 17, 1992

Gateway To Fix Glitch In Its 486 Motherboard

Users Complain of System Lockups

Gateway 2000 is offering to replace the motherboard in certain 486 systems that users said can lock up or report incorrect results when running applications compiled using FORTRAN compilers.

The problem, as reported by several Gateway customers on CompuServe, occurs when the 33MHz 486-based systems run programs that calculate numbers too large or too small for the machine to handle.

On his Gateway 2000 486/33 when the system took the result of its calculations, which was a very small decimal between zero and one, incorrectly changed the result to 10 and kept doing calculations.

He said the problem only happens the first time a program is run after the machine is rebooted.

Gateway's Schmith said the firm has only had reports of systems locking up, not generating inaccurate results.

See GATEWAY Page 32

Gateway Motherboard Fix Offered

Continued from Page 29

The lockup glitch, he said, is caused by a timing problem that causes the math co-processor in the 486 CPU to stop functioning before it has finished its calculations.

Micronics Computers Inc., which supplied the motherboards to Gateway, has made a "minor fix" that eliminates the problem, said Edward Ying, Micronics' product marketing manager in Fremont, Calif. Micronics has supplied Gateway with the new motherboards, he added.

Schmith said the problem only occurs on Industry Standard Architecture (ISA) versions of the 33MHz 486 Gemini motherboard. He added, however, that Gateway is not sure how many systems were released with the faulty motherboards.

Gateway, which has received approximately 50 complaints about the problem, will replace the motherboards free of charge, he said. The company can be reached at (800) 523-2000. ■

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- In Sweden, TOUCHE recently beat AST, DELL, COMPAQ and 6 others to win the highly coveted "GULD BITEN" (Gold Bit) award for superior performance and design!
- Computers Buyers Guide awarded TOUCHE's 486-33 it's BEST BUY award, stating it was "one of the fastest computers ever tested" after comparing TOUCHE, Northgate, Gateway 2000 and 6 others!
- In May 1992 Computer Shopper compared 8 486 EISA systems including ZEOS and Gateway 2000. TOUCHE "had the best price/performance ratio!"

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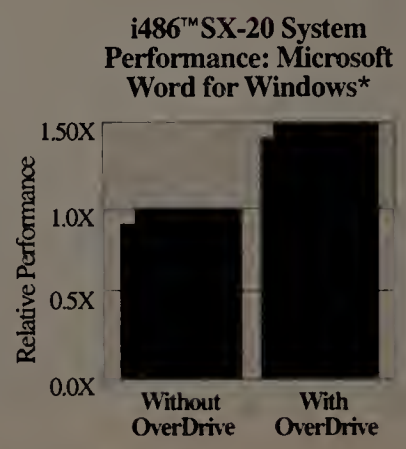

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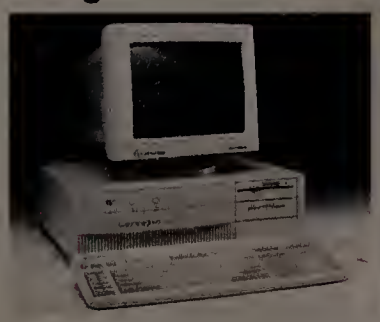
Bargains of the Month



The Gateway 25-MHz 486SX and the Dell System NL25 were the most aggressively priced desktop and portable PCs in the May survey by International Data Corporation.

Best-Sellers

Leading PCs sold through computer stores and dealers

1 *IBM PS/2 Model 55 SX*	6 *IBM PS/2 Model 56 SX*
2 *IBM PS/2 Model 70/20*	7 *Compaq LTE Lite/20*
3 *Compaq Deskpro 386/25M*	8 *Compaq Deskpro 386s/20*
4 *Compaq LTE Lite/25*	9 *Compaq Deskpro 486/33M*
5 *IBM PS/2 Model 35 SX*	10 *IBM PS/2 Model 56 SLC*

IBM and Compaq monopolized the best-seller list for PCs sold through the dealer channel, according to Storeboard Channel Tracking's April survey.

Over the Counter

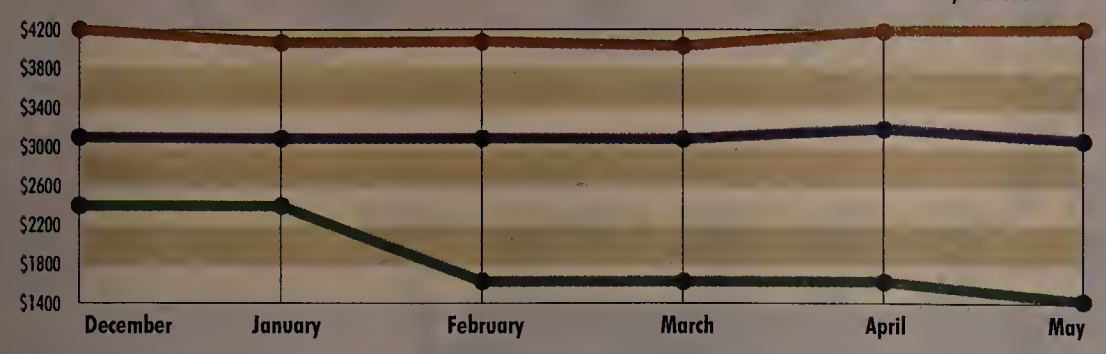
What you pay at retail stores for popular PCs

	Configuration				National				
	Speed (MHz)	RAM (MB)	Hard disk (MB)	Video adapter	List	Average	Boston	Chicago	Dallas/Ft. Worth
80386SX/SLC-based desktop PCs									
Compaq Deskpro 386s/20	20	2	60	VGA	$1899	$1604	$1600	$1399	$1446
Dell System 325 SX	25	2	52	VGA	$900	$900	$900	$900	$900
IBM PS/2 Model 35 SX-043	20	2	40	VGA	$1520	$1275	$1292	$1318	$1000
IBM PS/2 Model 56	20	4	80	VGA	$3030	$2419	$2316	$2310	$2412
IBM PS/2 Model 56 SLC	20	4	80	VGA	$3560	$2807	$2757	$2659	$2543
NEC PowerMate SX/20i	20	2	60	VGA	$1599	$1322	$1609	$1235	$1389
80386DX-based desktop PCs									
AST Premium II 386/33	33	4	210	VGA	$3795	$3087	$3134	$2978	$3015
Compaq Deskpro 386/25M	25	4	120	VGA	$3199	$2839	$2696	$2912	$2821
Dell System 333P	33	4	100	VGA	$1430	$1430	$1430	$1430	$1430
IBM PS/2 Model 70/25	25	4	160	VGA	$5475	$4228	$4238	$3945	$5475
80486SX-based desktop PCs									
ALR BusinessVEISA	20	5	120	none	$3495	$2889	$3054	$3169	$3121
AST Premium II 486SX/20	20	4	80	VGA	$3495	$2891	$2869	$2798	$3059
Compaq Deskpro 486s/25M	25	4	120	VGA	$3699	$3225	$3116	$3333	$3470
Gateway 25-MHz 486SX	25	4	200	VGA	$1770	$1770	$1770	$1770	$1770
IBM PS/2 Model 90XP-OH9	25	4	160	XGA	$6545	$5118	$5007	$4525	$4876
80486DX-based desktop PCs									
AST Premium II 486/33	33	4	210	VGA	$4495	$3735	$3965	$3548	$3934
Compaq Deskpro 486/33M	33	4	340	VGA	$5499	$4851	$5076	$4878	$4976
Compaq Deskpro 486/50L	50	8	340	VGA	$12,999	$11,143	$10,675	$10,712	$10,843
IBM PS/2 Model 90 XP-OKF	33	8	400	XGA	$9295	$7609	$7698	$8329	$8123
NEC PowerMate 486/33e	33	4	300	none	$5299	$4398	$4436	$4535	$4563
Portables/laptops									
AST Premium Exec 386SX/20	20 (SX)	2	40	VGA-LCD	$2395	$1982	$1995	$1971	$1984
AST Premium Exec 386SX/25	25 (SXL)	4	80	VGA-LCD	$3295	$2789	$2895	$2668	$2898
Compaq LTE 386s/20	20 (SX)	2	30	VGA-LCD	$3599	$3070	$3059	$2913	$3175
Compaq LTE Lite/20	20 (SL)	2	60	VGA-LCD	$3199	$2832	$2719	$2912	$2559
Dell System NL25	25 (SL)	2	80	VGA-LCD	$2199	$2199	$2199	$2199	$2199
IBM PS/2 Model L40 SX	20 (SX)	2	60	VGA-LCD	$1965	$1639	$1572	$1731	$1520
NEC UltraLite SL/20	20 (SL)	2	80	VGA-LCD	$2999	$2477	$2543	$2595	$2524
Toshiba T3300SL	20 (SL)	2	80	VGA-LCD	$3599	$3187	$3206	$3380	$3331
Toshiba T4400SX	25 (SX)	2	80	VGA-LCD	$4349	$3897	$3852	$4070	$3950
ZDS MastersPort 386SLe	20 (SL)	2	60	VGA-LCD	$3799	$3043	$3225	$2750	$2875

From an IDC survey of more than 180 computer dealers in eight metropolitan areas. Figures based on at least four price quotes for each machine. Prices are based on manufacturer's standard configuration without monitor.

Trend Line: 386 Prices Show Mixed Results

Street pricing on selected 386DX desktops with 4MB of memory



While 386 machines are pressured from below by 386SX machines and from above by 486SX and non-Intel CPUs, costs have held relatively steady this year among models sold through dealers. However, direct-sale vendors such as Dell Computer and Gateway 2000 continue to whittle away at pricing. You can now buy three Dell systems for the cost of the IBM model shown here.

Metropolitan

Los Angeles	Miami/ Ft. Lauderdale	New York	San Francisco Bay Area	Washington, D.C.
$1638	$1595	$1733	$1219	$1645
$900	$900	$900	$900	$900
$1572	$1254	$1314	$1475	$1155
$2727	$2394	$2579	$2532	$2303
$3204	$2785	$3020	$3123	$2706
$1330	$1343	$1301	$1432	$1303

$3068	$3347	$3084	$2926	$3211
$3028	$2756	$2919	$2759	$2791
$1430	$1430	$1430	$1430	$1430
$4928	$4246	$4527	$3550	$4161

$3099	$2970	$2884	$2789	$2713
$2926	$3299	$2927	$2741	$2812
$3502	$3107	$3375	$3190	$3225
$1770	$1770	$1770	$1770	$1770
$5891	$5031	$5518	$5123	$4974

$3922	$3904	$3848	$$3613	$3622
$5206	$4619	$5018	$4421	$4819
$10,988	$10,919	$11,669	$11,024	$11,136
$8366	$7292	$8089	$7645	$7064
$4504	$4650	$4313	$4432	$4319

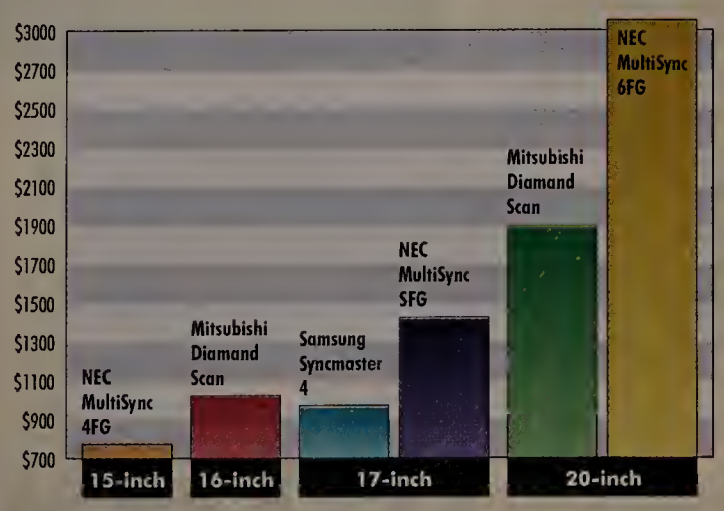
$2088	$2342	$1864	$1924	$1997
$2868	$2834	$2722	$2738	$2793
$3239	$3023	$3209	$2599	$3137
$2939	$2772	$3092	$2742	$2759
$2199	$2199	$2199	$2199	$2199
$1769	$1640	$1740	$2195	$1493
$2549	$2465	$2414	$2389	$2444
$3153	$2951	$3114	$3395	$3179
$3903	$3783	$3786	$4174	$3842
$3550	$3242	$3049	$2987	$2811

PC Futures: When the Going Gets Tough

Gateway 2000 carries off desktap Bargain af the Manth[1] honors with its 25-MHz 486SX, while Dell's new System NL25 wins as portable Bargain af the Month. Both firms nat anly slice away at prices, they also add (and withdraw) madels every month or so. Notably, Gateway is dropping its entire line of 386 desktops in favor of 386SX and 486SX models. Embattled though they may be, IBM and Campaq still split the April best-seller list between them. The PS/2 Model 56SLC (based on IBM's homegrown 386SLC) makes its first appearance, and customers apparently like the taste of Compaq's new Lite notebaaks. The 386DX desktap arena shows some enormous and widening price gaps between direct-sale vendars and suppliers wha sell thraugh dealers. There's also a very large price gap between standard 14-inch VGA monitors and larger manitors, although casts af the latter are dropping slightly as they begin to see higher manufacturing volumes.

Paying Extra to Get the Big Picture

Street pricing on selected 15-inch and larger monitors



Monitor prices are dropping, but far more slowly than PC prices. And while even the fanciest 14-inch monitors rarely break $600 on the street, the price you pay climbs dramatically as display size increases.

[1] Bargains of the Manth are determined by adjusting prices on PCs of a given class far standard memary and starage, then finding which PC campares best.

Saurce: Internatianal Data Carparatian.

End PC Envy

A Window on the Network

As you can see, DOS programs run alongside Microsoft Windows programs. You've seen this all before in our DESQview, right? Yes, but now there's more. DESQview/X lets you access and control a wide variety of PCs and workstations through your own PC. This feature is called remote computing.

In the example to the right, Lotus 1-2-3 is running in its own 386SX PC. The window above it is a Microsoft Project document running on a remote 486 PC under DESQview/X. Below that is the AixTerm program running on a remote Silicon Graphics Indigo workstation in another part of the company.

Brand and Platform Freedom

DESQview/X runs on 386SX PCs and above. And from within windows on those PCs, you can use programs* running on any number of remote DESQview/X PCs if your network supports NetWare or NetBIOS. Add DESQview/X's optional network interface for TCP/IP networks and you can also access programs running on IBM RS/6000s to H-P 9000 workstations. And it works the other way, too: these workstations can view and use DOS programs in their windows. * DOS graphics programs currently run only on your local PC.

Works the Way You Want

You can change menus, add sub-menus. Add menu items that run remote programs. Change commands. DESQview/X gives you a menu to use for your macros. And if you prefer a graphical desk top instead of a menu, DESQview/X's Application Manager gives you buttons for opening a set of programs used in a project or even for launching remote programs. What's more, you can specify window size and color. And if you are using DOS text programs, you can set them up so that the font changes size as you change the size of the window. We call this feature scalable DOS windows (see the Lotus 1-2-3 window at left).

Looks the Way Users Want

DESQview/X supports sculptured menus, customizable backgrounds, graphic buttons for launching programs, icons and online context-sensitive help to make computing easy and fun. If you are a DESQview user, you'll find DESQview/X very familiar, with an improved look. But if you prefer a different look and feel, we offer two other options: OSF/Motif and OPEN LOOK.

Introducing DESQview/X™ for DOS

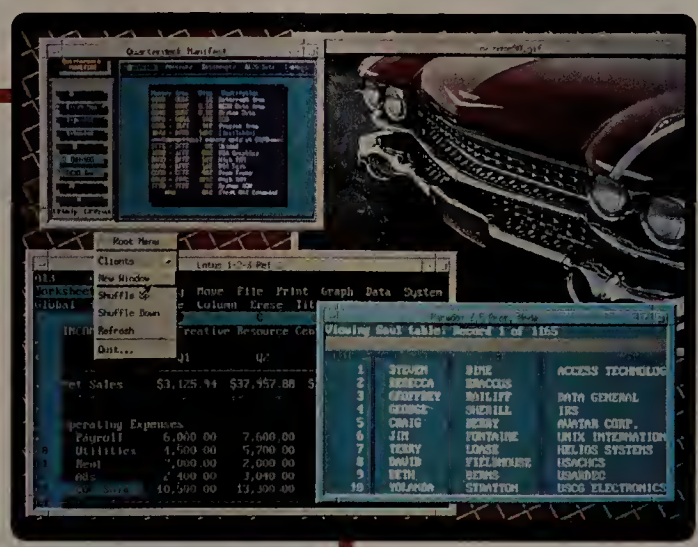
DESQview/X gives everyone access to the power of the fastest PC—or workstation—on the network.

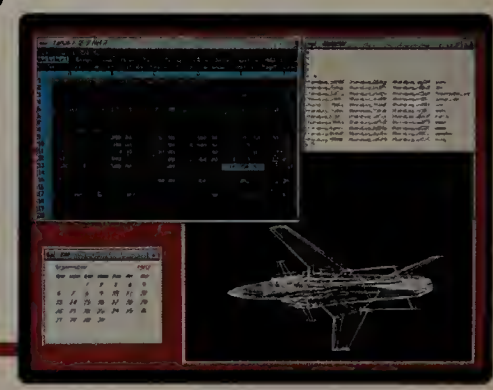
Remote Computing is a Reality

Set up and run programs on remote DESQview/X PCs on your network. Instruct and support users. Diagnose problems and solve them from your own PC. DESQview/X provides controlled access to every program on every PC.

Easy to Set Up and Administer

DESQview/X asks three questions: Do you wish to transfer files to and from other computers? Do you wish to use programs on other computers? and Do you wish other people to have access to programs on your computer? That's all it takes for DESQview/X to set itself up. DESQview/X incorporates QEMM-386 to assure maximum memory utilization and Manifest for easy diagnosis and problem-solving.





Here's How You Might Use DESQview/X on Your Network:

Say for instance your company uses a particular database that requires lots of horsepower or lots of memory to run. You can set it up on a 486 PC loaded with memory —then allow appropriate users access as you normally do on the network. The difference is that the database will be running on the remote 486 instead of the local PC. Users can take advantage of the power they need, when they need it. And you'll be able to best assess who actually needs his/her own 486 PC.

Give your PC the key to unlocking and sharing the power of other PCs on the network.

DESQview/X is a graphical multitasking environment for DOS. It is so powerful that it literally turns DOS PCs into graphical workstations. With DESQview/X, you can run DOS and Microsoft Windows programs simultaneously, view them in windows, transfer between them, create DESQview/X-global or program macros and manage your files.

DESQview/X makes computing lots easier, more productive, and more fun.

1991 BYTE AWARDS OF EXCELLENCE

With DESQview/X, you can now run programs and access files on other computers on the network and view them in windows on your own PC. Distribute tasks among computers based on their capabilities and available resources.

Remote diagnosis and support is now a reality. With DESQview/X you can support, instruct; even remotely demonstrate programs right at your user's computer.

If you have X-Window workstations, our optional 'DESQview/X to Other X Systems' TCP/IP Network Manager allows you to run workstation programs remotely from PCs.

For all this power, DESQview/X is stunningly easy to set up and use, and can run on any 386 or 486 PC with as little as 4MB RAM and 40MB hard disk.

DESQview/X multiplies the power of networked PCs by erasing the boundaries between computers; between programs and between users. Welcome to the limitless future of enterprise-wide computing.

Yes! Please Send:

Qty	Product	5-1/4	3-1/2	Each	Totals
	DESQview/X			$275.00	
	DESQview/X Network Mgr. (TCP/IP)			$200.00	
	OPEN LOOK interface			$200.00	
	OSF/Motif interface			$250.00	
	Shipping & Handling $10 (Canada & USA only)				
	California Residents add 8.25%				
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486SX PCs: DOUBLE-Performers

INTEL'S NEW OVERDRIVE CHIP GIVES A HUGE SPEED BOOST TO 486SX PCS. BUY A FAST, INEXPENSIVE 20-MHZ PC TODAY AND DOUBLE ITS SPEED, CHEAP, WHEN YOU NEED MORE HORSEPOWER TOMORROW.

Looking for the least expensive ticket to the red-hot world of 486 computing? Look no further than 20-MHz 486SX PCs. Introduced only 18 months ago, these upgradable performers are already being supplanted by 25-MHz models, which will undoubtedly send 20-MHz prices falling even lower than the budget prices you'll find in this review. Get one of these machines while they last, and you may bag one of the best deals in computing today.

If that kind of value sounds good to you, here's some free advice about 486SX systems: Never, ever, buy a 487SX math coprocessor, even if you crunch floating points for breakfast. Why? Because that 487SX coprocessor socket could hold something far more useful: an Intel OverDrive processor.

An OverDrive processor is an upgrade on a chip, essentially

BY REX FARRANCE AND MICHAEL GOODWIN

PHOTOGRAPHS BY IAN MACKEY

-TIME

a replacement CPU-plus-coprocessor; think of it as a souped-up 486DX. What does it do? To find out, turn to the *PC World* Test Report in this article. As the report shows, we began by running our standard benchmarks on 23 of the latest 20-MHz 486SX systems. Then we plugged OverDrive chips into the same machines and tested them again. The result? Performance increases averaging 26 to 350 percent, depending on the application.

That wild 350 percent figure derives from the *1-2-3* test; the OverDrive, like the 486DX (and unlike the 486SX) has an on-chip coprocessor that tears through *1-2-3* financial and statistical functions. The *Windows* benchmark (which doesn't employ the coprocessor) tells a more typical story: a 50 to 70 percent increase, which is about what you can expect to see with most business applications.

Yes, this is what Intel's "Vacancy" ad campaign, with neon sign pointing toward waiting socket, was all about. All the PCs in this review have dutifully danced to Intel's tune. Some have an Intel-approved upgrade socket that holds either a 487SX or an OverDrive chip; others require you to pop out the 486SX CPU and replace it with the OverDrive. In either case, the OverDrive processor doubles the 20-MHz signal from the system's clock chip to increase internal processing speed by a factor of two.

That means the OverDrive processes data and instructions inside its 8K on-chip cache twice as fast as a 486SX can. You get an approximate 70 percent increase in the real world, because the 8K cache can't hold everything and the CPU must fetch from the slower off-chip memory. Also, disk performance isn't affected. But no matter. The cost of an OverDrive chip—which you can only buy retail, and which should sell for $450 or so at your nearest superstore or electronics supplier—is a small price to pay for such a big performance boost.

486SX Prices Are Dropping So Fast, You Can't Keep Up!

Wow! Look what happened to list prices in just three months: They dropped almost $200 on average. Our Best Buy Mitac 4270E led the way with a $650-plus plunge, and the Best Buy Northgate Elegance ZXP 486SX/20 dropped a healthy $250.

	List price as of June 1992 [1, 2]	Price drop from March 1992
AcerPower 386SX/486SX	$3181	none
AcerPower 486SX	$4122	none
ALR BusinessStation 486ASX	$4367 [3]	$100
ALR BusinessVEISA 486ASX	$4467 [3]	$100
ATronics ATI-486/SX-20	$1745 [4]	$389
Blackship BLK 486SX/20	$1985	$186
Boss 486SX/20 Coche	$2995 [5]	$500
Club American Falcon 420 SX	$2487	$394
Dell System 486D/20	$2548 [5]	$459
Dell System 486P/20	$2248 [5]	$359
Everex Tempo M 486SX/20	$3817	none
First Computer FCS 486SX/20	$1599	$100
Grid MFP/420s Model 120	$3013	$105
IDS 420S Power User Pro	$2345	none
Mitac 4270E	$2259	$660
NEC PowerMate 486SX/20e	$4382	$35
Northgate Elegance ZXP 486SX/20	$2399 [6]	$250
Soft-Hard PowerBox PBS1 486SX-20	$1899 [5]	$150
Swan 486SX/20	$2445 [5, 7]	none
Swan 486SX/20M	$2420 [5, 7]	$100
Touche 486SX/20	$1999	none
USA Flex 486SX 20	$1695 [5, 8]	$300
Wang PC 441/20SC	$5420	none

[1] Except as noted, price includes 4MB RAM, one floppy drive, hard drive, VGA, color VGA monitor, mouse, Windows 3.1, and DOS 5.0.
[2] June 1992 street prices unavailable at press time.
[3] With 5MB RAM.
[4] With removable hard disk.
[5] With two floppies.
[6] Includes QA Plus diagnostics.
[7] Includes Wealthbuilder, Quicken for Windows, Microsoft Works for Windows.
[8] Includes PFS WindowWorks.

The Buys of the Moment

To find the best PCs in this category, we had to rate each of the 23 candidates in two ways—as 20-MHz 486SXs and as 40-MHz OverDrive systems. Along the way, we checked the OverDrive-equipped systems six ways from Sunday for compatibility. None of the systems dropped out.

The speed test results include a few surprises. We expected the systems with external memory caches (that is, a cache of fast memory on the motherboard external to the 486SX) to have the performance edge, but in the end there wasn't much correlation. We believe the reason is that Intel's on-chip cache is so efficient, only large-memory jobs—such as serving a network or multitasking several large *Windows* apps—are likely to benefit much from an external cache.

Performance is only one element. Surveys tell us *PC World* readers care about price even more. Next in priority is service and support. We call vendors with tech-support questions and factor in availability of on-site service, repair turnaround policy, and so on.

Buying Smart: Two Steps to a Faster Desktop

How are 486SXs different from all other PCs? Easy: They're the only systems that accept Intel's OverDrive CPU upgrade, which boosts processing speed by approximately 70 percent when running most business applications. Add the street price of an OverDrive chip—around $450—to the price of any of the systems in this review, and you'll have an idea of how much it costs to achieve maximum performance.

PERFORMANCE

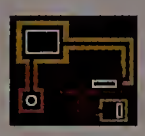
Some systems showed bigger improvements than others when we boosted them into OverDrive. The disparity can be attributed to such design factors as special memory-cache algorithms, burst-memory controllers, and write buffers, which enable some systems to benefit more from the double-speed processor. But any way you look at it, the OverDrive CPU is one of the least expensive ways you'll find to improve performance.

CPUs and upgrades aside, peripherals always have their own effect on performance. If you use a program such as *dBASE* or *Paradox* that continually calls on the hard disk, you should consider ordering a caching controller, which can boost disk-intensive performance. A fast video adapter can also help speed things up, especially if you're a desktop publisher, run presentations, or use *Windows* in 1024 by 768 mode.

Our performance weighting system places the most emphasis on *1-2-3*. Overall, the Best Buy Mitac did best in the plain-vanilla 20-MHz 486SX tests, while the AcerPower 486SX turned in the best scores with the OverDrive chip installed.

PRICE

A good price is as important to most of us as performance (if not more so). Price comparisons in our reviews are based on street prices. For every system (except those sold directly), we call at least three PC dealers in eight major cities across the country to get price quotes, and then we average the results. Our researchers price units set up in the same standard configuration: 4MB RAM, a 120MB to 130MB hard disk (except where noted), one floppy drive, VGA and color display, one parallel and two serial ports, keyboard, mouse, DOS 5.0, and *Windows*. The least expensive system in our roundup is First Computer's value-conscious FCS 486SX/20.



EXPANDABILITY

All the systems reviewed here support an OverDrive chip, but that's just one upgrade strategy. A processor-board design lets you swap up to 50 MHz and beyond, giving you the greatest performance potential—though this scheme does tend to add to system cost. We give extra points for Zero Insertion Force (ZIF) sockets, which make for a truly painless chip-level upgrade.

You'll also need sufficient expansion slots and drive bays. If you're planning to connect your 486SX/20 to a network, you'll probably be able to get by with three bays and four free expansion slots. But for a stand-alone PC, you'll want at least one more bay and one more slot.

All but one of these 486SXs—the AcerPower 386SX, with its low 8MB RAM limit—can accommodate at least 32MB of fast RAM (RAM that is accessed at CPU speed). Unless you're planning to use your 486SX as a network server or UNIX machine, you won't need more than 16MB; most people do just fine with 4MB. NEC's PowerMate 486SX/20e has the largest capacity for peripherals and memory, with the Best Buy Northgate Elegance ZXP close behind.

SERVICE AND SUPPORT

All these systems come with at least a one-year warranty and (with the exception of the Acer machines) a tech support number. Unless your company is large enough to have its own service department, it's reassuring if a vendor offers low-cost or free on-site service, especially if the company sells direct.

We test support quality by calling the central number, asking three questions of varying difficulty, and rating the responses on promptness, courtesy, and accuracy. Then we factor in extras such as toll-free phone support and fax lines. We rate dealer support by looking at the vendor's policies on dealer training, inventory, and support staff. You're dealing with human beings when you call tech support, so there's some variation in the same vendor's ratings from review to review. This time Boss earned the best support rating, but for all intents and purposes you can expect equally fine support from ALR, Blackship, Club American, Dell, Swan, Wang, and two of our Best Buys: Mitac and Northgate.

DESIGN AND CONSTRUCTION

To make sure your system will support all common software and peripherals, we run these systems through tough compatibility tests. All the systems scored perfectly on compatibility. We also look for rugged design and ergonomic details. The Best Buy Northgate Elegance ZXP, the Touche 486SX/20, and the ALR BusinessStation and BusinessVEISA all took top design honors.

When the last hard disk spun down and the last phone call was made, IDS's 420S Power User Pro, Mitac's 4270E, and Northgate's Elegance ZXP *all* snagged *PC World* Best Buy awards. The IDS and the Mitac both rate four stars in performance, with or without the OverDrive, and the Mitac adds an excellent service rating. The Northgate's performance was good, although not as scintillating as either the IDS's or the Mitac's, but its combination of super upgradability, expandability, and service package usher it into the winner's circle.

We checked the systems' street prices with 4MB of RAM, hard disk, and a color VGA monitor (OverDrive chip not included): The IDS and Mitac were $2345 and $2521 respectively (with 200MB hard disks), and the Northgate cost $2649 with a 120MB hard disk.

Performance addicts should note that the $3392 AcerPower 486SX was the fastest system overall, while those who are looking for the lowest price should check out First Computer's FCS 486SX/20.

With prices and technology so volatile, some people say that *any* decision you make today will be the wrong decision six months from now. We don't agree. The only real mistake you can make is burning your bridge to the future before you cross it. These 20-MHz 486SX PCs get you into the game for a very small buy-in, and they let you hedge your bets for the future—not just for the OverDrive processor, but for the upgrade chips of tomorrow. Now, may we interest you in a few slightly used 487SX math coprocessors?

Rex Farrance is an assistant editor and Michael Goodwin an associate editor for PC World.

For more information about all products in this article, circle reader service no. 902.

The AcerPower offers a chip-only switch from 386SX to 486SX. But watch that low RAM limit.

AcerPower 386SX/486SX

★★ 1/2 **PROS:** Chip-level upgrade from 386SX, fast Paradox performance, 2MB caching disk controller **CONS:** Poor expandability with tight 8MB RAM limit, have to pull the 486SX to add a doubler, tied for lowest service and support rating

We tested this PC configured with a 486SX and a 20/40-MHz OverDrive; with the latter, it came in second only to its near-twin, the AcerPower 486SX, on the *WordPerfect* benchmark. And with the help of the 2MB UltraStor IDE caching controller and 120MB Conner CP3204F hard disk, the two Acers aced the *Paradox* test too, both with and without the OverDrive.

All this at a $2192 street price is mighty tempting. But you could easily butt your head against the system's anemic 8MB RAM limit, and you get only three free slots and three to four externally accessible drive bays (depending on whether one holds a 5¼-inch drive). Worst of all, the Acer comes with dealer-only service and no central tech support. The machine has an intriguing design, but as a 486SX, it's a small fish in a big pond.

AcerPower 486SX

★★ 1/2 **PROS:** Fast, chip upgradable to 33-MHz 486DX, 2MB caching controller, one-touch OverDrive upgrade, high 98MB RAM capacity **CONS:** Expensive, limited slots and bays, tied for lowest service and support rating in roundup

Although it has a different motherboard, the AcerPower 486SX closely resembles its 386SX/486SX sibling. But this Acer is faster, with the best marks overall on *Paradox*, *AutoCAD*, and *WordPerfect* and a tie for the fastest *Windows* times with the OverDrive CPU installed. You also get a sophisticated CPU upgradability scheme that lets you replace the standard 20-MHz 486SX with either a 20/40-MHz doubler, a 33-MHz 486DX, or the forthcoming 33/66-MHz OverDrive.

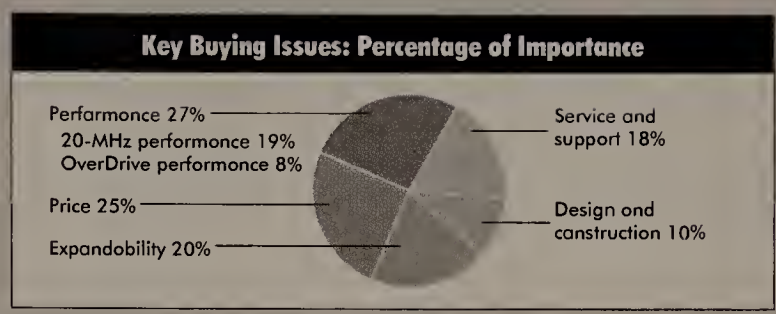
At $3392, however, the AcerPower 486SX is the second most expensive PC here. You get the same limitations on peripherals and drives as with the AcerPower 386SX. Service and support are also the same, including the stiff $335 you pay for a year's on-site service. The AcerPower 486SX's high price and limited support options make it only a fair value.

The sleek AcerPower 486SX offers an easy chip-only upgrade to a 33-MHz 486DX.

IDS Is Fast, Inexpensive, Expandable

Affordability and an upgrade path are essentials in 20-MHz 486SX systems. In addition, any PC must be expandable enough to accept the memory and peripherals you'll need in the future.

At 20 MHz, these affordable desktops are no slouches, but with Intel's 40-MHz OverDrive processor, they really burn. The **IDS 420S** and **Mitac 4270E** parlayed a winning combination of performance, price, and service into Best Buys. The **Northgate Elegance ZXP's** super expandability, service, and design put it in the winners' circle as well. We also recommend the inexpensive, well-designed **Touche 486SX/20**.



Excellent ★★★★
Good ★★★
Fair ★★
Poor ★

	Reader service number	Performance	Price[1]	Expandability	Service and support	Design and construction	Overall
AcerPower 386SX/486SX	750	☆☆☆½	☆☆☆½	☆	☆½	☆☆☆½	★★½
AcerPower 486SX	750	☆☆☆☆	☆½	☆☆☆	☆½	☆☆☆½	★★½
ALR BusinessStation 486ASX	751	☆☆☆½	☆☆	☆☆½	☆☆☆☆	☆☆☆☆	★★★
ALR BusinessVEISA 486ASX	751	☆☆☆½	☆½	☆☆☆½	☆☆☆☆	☆☆☆☆	★★★
ATronics ATI-486/SX-20	752	☆☆☆½	☆☆☆½	☆☆☆	☆☆☆½	☆☆½	★★★½
Blackship BLK 486SX/20	753	☆☆☆	☆☆☆½	☆☆☆	☆☆☆☆	☆☆☆	★★★½
Boss 486SX/20 Cache	754	☆☆☆½	☆½	☆☆☆	☆☆☆☆	☆☆☆½	★★★
Club American Falcon 420 SX	755	☆☆☆½	☆☆½	☆☆☆	☆☆☆☆	☆☆☆½	★★★½
Dell System 486D/20	756	☆☆☆½	☆☆	☆☆☆	☆☆☆☆	☆☆☆½	★★★
Dell System 486P/20	756	☆☆☆½	☆☆☆	☆☆½	☆☆☆☆	☆☆☆	★★★
Everex Tempo M 486SX/20	757	☆☆☆½	☆½	☆☆☆½	☆☆☆	☆☆☆	★★★
First Computer FCS 486SX/20	758	☆☆☆	☆☆☆☆	☆☆☆	☆☆½	☆☆☆	★★★
Grid MFP/420s Model 120	759	☆☆☆½	☆☆	☆☆	☆☆☆½	☆☆☆	★★★
IDS 420S Power User Pro	760	★★★★	★★★½	★★★	★★★½	★★★	★★★★
Mitac 4270E	761	★★★★	★★★	★★½	★★★★	★★★½	★★★★
NEC PowerMate 486SX/20e	762	☆☆☆	½	☆☆☆☆	☆☆☆	☆☆☆½	★★½
Northgate Elegance ZXP	763	★★★	★★★	★★★★	★★★★	★★★★	★★★★
Soft-Hard PowerBox PBS1 486SX/20	764	☆☆☆½	☆☆☆☆	☆☆☆	☆☆½	☆☆☆	★★★½
Swan 486SX/20	765	☆☆☆	☆☆☆½	☆☆☆	☆☆☆☆	☆☆☆	★★★½
Swan 486SX/20M	765	☆☆☆	☆☆☆½	☆☆☆	☆☆☆☆	☆☆☆	★★★½
Touche 486SX/20	766	☆☆☆	☆☆☆☆	☆☆☆	☆☆☆½	☆☆☆☆	★★★½
USA Flex 486SX 20	767	☆☆	☆☆☆☆	☆☆☆	☆☆☆½	☆☆☆	★★★
Wang PC 441/20SC	768	☆☆☆	☆☆	☆☆½	☆☆☆☆	☆☆☆½	★★★

Overall value is calculated by multiplying each category rating by the category's weight percentage, summing the results, and rounding to the nearest half number.

[1] Price ratings are based on street prices. Before the ratings are calculated, however, the street prices are adjusted to allow for bundled software and hardware over and above our standard configuration. One-quarter of the list price of the software is deducted. If the system is sold via dealers, 70 percent of the list price of the extra hardware is deducted; if the system is sold direct, 100 percent of the list price of the extra hardware is deducted. Bundled software and extra hardware for each system are noted in the Features Evaluation.

ALR BusinessStation 486ASX

★★★ **PROS:** Excellent support and design, very good performance, one-touch OverDrive upgrade, CPU-card upgrade to 33-MHz 486, EISA bus **CONS:** High price, little room for additional boards and drives

ALR produces fine PC designs, and the sleek BusinessStation 486ASX is no exception. We tested this EISA system with ISA peripherals only, but it still proved fast, placing near the top on the *Paradox* and *Windows* tests. The doubler is easy to install, and if you really want to reach for the brass ring, you can swap in a new CPU card and upgrade to a 33-MHz 486DX. But the BusinessStation's $3081 price is steep.

ALR's service and support policies are of the highest rank, but expansion capacity is poor. And although the system's 33MB RAM capacity is fine, its three storage bays are barely adequate, and a total of two free EISA slots is just too tight. If you can live with these limitations, this EISA PC is a good value. But for just a little more dough, the BusinessVEISA 486ASX is a better choice.

The BusinessStation 486ASX is a beautifully designed EISA system, but its slot count is limited.

The BusinessVEISA has an expandability and performance edge over the BusinessStation.

ALR BusinessVEISA 486ASX

★★★ **PROS:** Excellent support, design, and OverDrive performance; one-touch OverDrive upgrade; CPU-card upgrade to 33-MHz 486; EISA bus **CONS:** High price

The compact BusinessVEISA 486ASX desktop PC shares many features with ALR's BusinessStation 486ASX, right down to the great design, 5MB of standard RAM, and a 120MB Western Digital Caviar 2120 IDE drive. As with the other EISA ALR, we tested the machine with ISA peripherals only and still saw very good overall performance. With an OverDrive chip installed, the BusinessVEISA nets a virtual tie for second on the *Windows* test.

You get ALR's terrific service and support, including a year of free on-site service and excellent toll-free tech support, even on weekends. Expandability is good, with a 49MB RAM ceiling; four EISA slots; one free 16-bit slot; and four storage bays, three of them externally accessible.

Which ALR to buy? At a street price of $3308, this system costs only about $200 more than the BusinessStation and delivers a better value.

ATronics ATI-486/SX-20

★★½ **PROS:** Very good price, plenty of slots and bays, removable hard drive option, good service and support **CONS:** Case could be sturdier, hard drive cage and 486SX processor must be removed to install OverDrive CPU, poor documentation

The compact ATI-486/SX-20 desktop has a lot to recommend it, not the least of which is a fine $2134 street price. Performance was solid, with better-than-average *1-2-3* numbers, including a fourth-place finish with the 20-MHz 486SX CPU installed. Our test unit had an optional removable hard drive module with a 120MB Conner CP 30104 IDE disk. At just $59 more than a fixed disk, this module is an attractive security option.

The ATI-486/SX-20 has an outstanding appetite for peripherals, with six free slots and five bays—and its 200-watt power supply should ensure that its eyes aren't bigger than its stomach. On the downside, to install the 20/40-MHz doubler, we had to completely remove the drive cage. Still, this system is a well-supported midpack performer that buyers on a budget should find worth their consideration.

If you want to lock up your data, ATronics gives you an optional removable hard disk.

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Minicartridge Tape Drive Comparison

	Iomega Tape250	CMS Jumbo	Irwin AccuTrak
QIC 80 Read & Write	•	•	
QIC 40 Read	•	•	
Irwin 80 & 40 Read	•		•
Windows 3.1 & DOS software	•		
Fits standard 1" bay	•		
QIC 80 entry price	$299	$350	$349

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FEATURES EVALUATION

486SX/20s: Affordable and Upgradable

These 486SX PCs offer a big helping of power at prices starting under $2000. When you're ready, you can add an Intel OverDrive upgrade chip to any of the systems and enjoy a huge performance increase.

● Yes
○ No
n/o = not applicable

	AcerPower 386SX/486SX	AcerPower 486SX	ALR BusinessStation 486ASX	ALR BusinessVEISA 486ASX	ATronics ATI-486/SX-20	Blackship BLK 486SX/20	Boss 486SX/20 Cache	Club American Falcon 420 SX	Dell System 486D/20
Standard features									
Street price 3/31/92[1]	$2192	$3392	$3081[2]	$3308[2]	$2134[3]	$2171	$3386[4]	$2881	$3007[4]
List price 3/31/92[1]	$3181	$4122	$4467[2]	$4567[2]	$2134[3]	$2171	$3495[4]	$2881	$3007[4]
Memory coche (K)	○	256	64	64	64	○	64	256	○
Bus type (ISA, EISA)	ISA	ISA	EISA	EISA	ISA	ISA	ISA	ISA	ISA
Hard disk type/size /averoge access time	IDE/200MB /12ms	IDE/200MB /12ms	IDE/120MB /16ms	IDE/120MB /16ms	IDE/120MB /15ms	IDE/120MB /15ms	IDE/130MB /16ms	IDE/120MB /16ms	IDE/120MB /15ms
Power supply (wotts)	145	145	150	150	200	250	200	200	224
Expandability									
Free 32-/16-/8-bit slots	0/3/0	0/3/0	2/1[8]/0	4/1/0	0/5/1	0/6/0	0/6/1	0/5/0	0/6/0
Accessible/internal drive bays	4/0	4/0	2/1	3/1	5/0	4/2	5/1	3/1	3/1
Lorgest hard disk option	245MB	245MB	535MB	1.7GB	500MB	1.7GB	1GB	1.2GB	1.4GB
CPU upgrade path									
CPU board	○	○	●	●	○	○	○	●	○
Clock-ond-chip	○	●	●	●	○	○	○	○	●
ZIF socket/upgrade socket	○/○	○/●	○/●	○/●	○/○	○/●	○/●	○/●	○/○
Weitek socket	○	●	○	○	●	●	○	○	○
Fost-RAM capocity (MB)	8	98	33	49	64	32	32	64	64
Design and construction									
Setup utility in ROM	●	●	●	●	●	●	●	●	●
Compact footprint or tower model	●	●	●	●	●	○	●	○	●
Front panel on/off switch	●	●	●	●	○	●	●	○	●
Parallel/serial/mouse ports	1/2/1	1/2/1	1/2/1	1/1/1	1/2/0	1/2/0	1/2/0	1/2/0	1/2/1
Easy-open case	○	○	○	○	○	○	○	○	○
Service and support									
Warranty (months)	12	12	12	12	12	12	24	12	12
On-site service/under $100 per year	●/○	●/○	●/●	●/●	●/●	●/●	●/●	●/●	●/●
Turnoround policy	5 doys	5 doys	72 hours	72 hours	one week	48 hours	48 hours	24 hours	72 hours
Free unlimited support	○	○	●	●	●	●	●	●	●
Vendor support									
Central support/toll-free	○/○	○/○	●/●	●/●	●/○	●/●	●/●	●/●	●/●
Doily support (hours)	n/o	n/o	11	11	9	9	11	11	15
Weekend support	n/a	n/o	●	●	○	○	○	○	●
Electronic BBS/fax	●/○	●/○	●/●	●/●	●/○	●/○	●/●	○/●	●/●
Vendor-to-deoler support									
Dedicated support stoff required	○	○	○	○	○	no deolers	○	●	no deolers
Support staff troining required	○	○	○	○	○	no deolers	○	●	no deolers
Dedicated support line for dealers	●	●	●	●	●	no deolers	○	○	no deolers
Inventory and ports requirement	○	○	○	○	●	no deolers	○	○	no dealers

[1] Except os noted, price includes 4MB RAM, one floppy drive, hard drive os listed, VGA, color VGA monitor, mouse, Windows 3.1, ond DOS 5.0.

[2] Includes 5MB RAM.

[3] Includes optionol removoble hord disk.

[4] Includes two floppies.

[5] Includes QA Plus.

Dell System 486P/20	Everex Tempo M 486SX/20	First Computer FCS 486SX/20	Grid MFP/420s Model 120	IDS 420S Power User Pro	Mitac 4270E	NEC PowerMate 486SX/20e	Northgate Elegance ZXP	Soft-Hard PowerBox PBS1 486SX/20	Swan 486SX/20	Swan 486SX/20M	Touche 486SX/20	USA Flex 486SX 20	Wang PC 441/20SC
$2607[4]	$3280	$1699	$3118	$2345	$2521	$3782	$2649[5]	$2049[4]	$2445[4,6]	$2520[4,6]	$1999	$1995[4,7]	$2979
$2607[4]	$3817	$1699	$3118	$2345	$2919	$4417	$2649[5]	$2049[4]	$2445[4,6]	$2520[4,6]	$1999	$1995[4,7]	$5420
○	12B	64	○	64	64	○	64	64	○	12B	64	64	○
ISA	ISA	ISA	ISA	ISA	EISA	EISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA
IDE/120MB /15ms	IDE/130MB /16ms	IDE/120MB /16ms	IDE/120MB /16ms	IDE/200MB /15ms	IDE/200MB /12ms	IDE/120MB /15ms	IDE/120MB /16ms	IDE/120MB /15ms	IDE/120MB /16ms	IDE/120MB /16ms	IDE/240MB /16ms	IDE/120MB /16ms	IDE/130MB /16ms
224	200	250	200	230	200	285	220	250	200	200	300	200	145
0/3/0	0/6/1	0/5/1	0/3/0	0/6/1	4/0/0	5/0/0	0/5/1	0/6/1	0/4/2	0/5/0	0/6/1	0/6/0	0/4/0
2/1	5/0	6/3	3/0	3/2	3/1	3/2	3/4	3/3	3/1	3/1	4/4	5/0	2/2
500MB	535MB	200MB	440MB	3GB	1.2GB	1.4GB	1.2GB	2.5GB	400MB	400MB	1.6GB	1.2GB	637MB
○	●	○	○	●	●	●	●	○	○	●	○	○	○
●	○	○	○	●	●	○	●	○	○	○	○	○	○
○/○	○/○	○/○	○/○	●/●	●/●	●/●	●/●	○/●	○/○	○/○	○/●	○/○	○/●
○	●	●	○	●	●	●	●	○	●	●	○	●	●
64	32	32	32	32	64	64	32	32	32	64	32	32	32
●	●	●	●	●	●	●	●	●	●	●	●	●	●
●	○	●	●	●	●	○	●	●	○	○	●	●	●
●	○	●	●	●	●	●	●	●	○	○	●	●	●
1/2/1	1/2/0	1/2/0	1/2/1	1/2/0	1/2/1	1/2/1	1/2/0	1/2/0	1/2/0	1/2/0	1/2/0	1/2/0	1/2/1
○	○	○	○	●	●	○	●	○	○	○	○	○	○
12	12	12	12	12	12	12	12	12	24	24	24	12	12
●/●	●/○	○/○	●/●	●/●	●/●	●/○	●/●	○/○	●/●	●/●	●/●	●/●	●/○
72 hours	none	48 hours	none	48 hours	one week	48 hours	5–7 days	none	none	none	24 hours	48 hours	48 hours
●	●	●	●	●	●	●	●	●	●	●	●	●	●
●/●	●/○	●/○	●/●	●/●	●/●	●/●	●/●	●/●	●/●	●/●	●/●	●/●	●/●
15	12	8	11	9	10	9	24	9	12	12	8	24	19
●	○	○	○	●	●	○	●	●	●	●	○	●	○
●/●	●/●	○/●	●/○	●/●	●/●	●/●	●/●	○/●	●/●	●/●	○/●	○/●	●/●
no dealers	○	●	no dealers	no dealers	no dealers	●	no dealers	○	no dealers	no dealers	no dealers	no dealers	no dealers
no dealers	○	○	no dealers	no dealers	no dealers	●	no dealers	○	no dealers	no dealers	no dealers	no dealers	no dealers
no dealers	●	○	no dealers	no dealers	no dealers	●	no dealers	○	no dealers	no dealers	no dealers	no dealers	no dealers
no dealers	○	○	no dealers	no dealers	no dealers	●	no dealers	○	no dealers	no dealers	no dealers	no dealers	no dealers
				BEST BUY	BEST BUY		BEST BUY						

[6] Includes WealthBuilder, Quicken for Windows, Microsoft Works for Windows.

[7] Includes PFS: WindowWorks.

[8] Proprietary slot; takes ALR peripherals only.

Blackship BLK 486SX/20

★★½ **PROS:** Excellent service and support, lots of storage bays, very good price, one-touch OverDrive upgrade **CONS:** Poor documentation

We reviewed a Blackship with the same name in March. But while today's BLK 486SX/20 looks the same, it's now built around an AMI Super Voyager motherboard, which gives you an upgrade socket for one-touch OverDrive support. The $2171 price is very good, and you get six free slots and six drive bays, four of which are externally accessible.

Blackship's track record should allay any fears you might have about buying from a small company. This vendor consistently receives high marks for its reliable service and support. The BLK 486SX/20's excellent rating derives partly from a year of free on-site service and toll-free tech support provided by staff who are patient and helpful. Blackship even pastes its toll-free tech support number onto the rear of the case. Like most Blackship products we've reviewed recently, the BLK 486SX/20 represents a solid, no-nonsense value.

With the big BLK 486SX/20 system, you get lots of room for peripherals.

Boss puts buyers at ease with a terrific two-year warranty backed by two years' on-site service.

Boss 486SX/20 Cache

★★ **PROS:** Lots of slots and bays, excellent service and support includes two-year warranty, one-touch doubler upgrade **CONS:** Expensive

The Boss 486SX/20 Cache is a nice little minitower that doesn't take much desk space yet offers plenty of capacity for peripherals. You get seven free slots, two floppy drives, six bays (all but one externally accessible), and a 200-watt power supply. However, if you fill the lowest 3½-inch drive bay, one of the slots won't be able to accept a full-length card. This system has plenty of speed, with very good *Windows* performance and high marks on the *dBASE* and *1-2-3* benchmarks both with and without a doubler. To help you keep dust out, Boss designed in a plastic door to cover the drives, on/off switch, and turbo and reset switches.

Boss tallied the most points for service and support with a fine package including an outstanding two-year warranty, free on-site service, and a 48-hour service turnaround policy. This PC is expensive, however: Its $3386 price is third highest in this review.

Club American Falcon 420 SX

★★½ **PROS:** Easily upgradable, excellent OverDrive performance, excellent service and support with a 24-hour turnaround policy **CONS:** Somewhat expensive

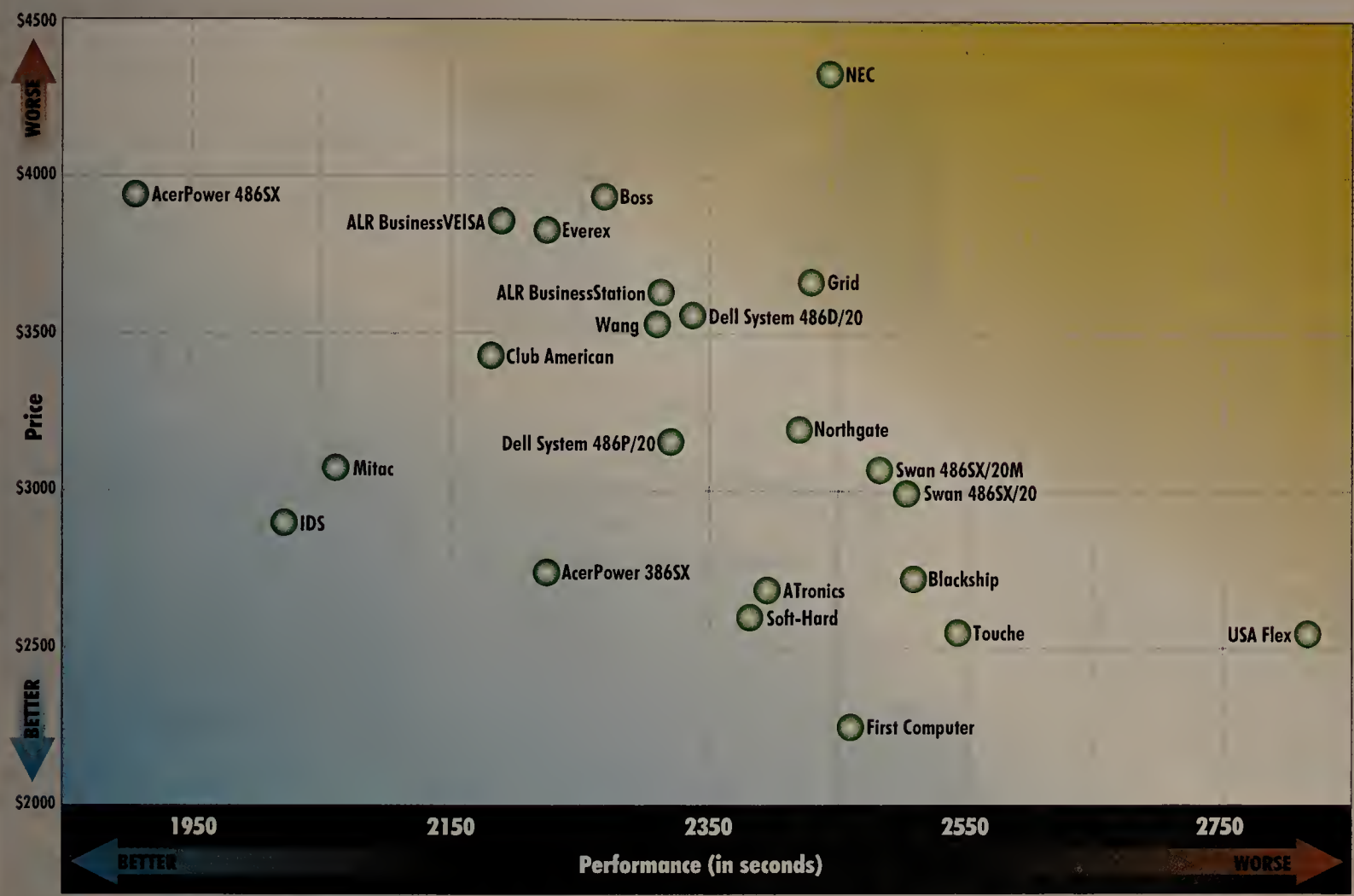
At $2881, the Club American Falcon 420 SX is not cheap. But then again, not every 20-MHz 486SX PC gives you an upgrade path to a 50-MHz 486DX2. A single system board accepts CPU modules from 25-MHz 386DX to 50-MHz 486DX2. The 20-MHz 486SX module has an upgrade socket for a one-step upgrade to the OverDrive CPU. As equipped, the Club was quite fast, with fine *dBASE* results and excellent OverDrive marks, including a tie for first place on *AutoCAD*.

The first things you see when you open the sturdy, full-size desktop case are a motherboard map and a switch guide, both conveniently mounted on the 200-watt power supply. There are five free slots and four drive bays, three of which are externally accessible. You also get four-star service and support. This system is a very good value: The extra dollars buy you upgrade flexibility you can't find in most machines.

Thinking of the future? The Club American Falcon 420 SX's CPU-card design protects your options.

IDS, Mitac Win Price-Performance Honors

This chart shows how 23 486SX/20 systems compare on price and *performance—with the OverDrive processor installed. The best deals will be found toward the lower left-hand corner; the worst deals congregate toward the upper right. Performance numbers are based on normalized results of our full 40-MHz test suite and are reported as total number of seconds. Prices are based on an average of each system's street prices plus $549 for the 20/40-MHz OverDrive processor.*



Dell System 486D/20

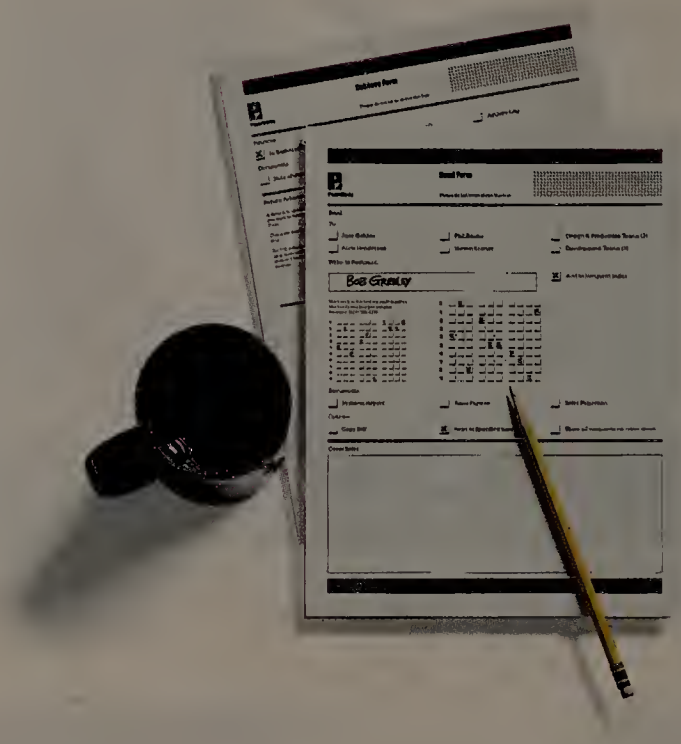
★★★ **PROS:** Flexible CPU upgrades, fine support **CONS:** On the expensive side, must pull 486SX to add a doubler

The Dell System 486D/20 has one of the most flexible upgrade schemes you can find. You need only move a jumper to change the speed of your system clock. Take your choice: 16 MHz, 20 MHz, 25 MHz, or 33 MHz. Dell packs two floppy drives, a 120MB Maxtor 7120AT hard disk, four drive bays, six free slots, and a big 224-watt power supply into the good-looking compact box. The $3007 price reflects Dell's midrange to high-end position in the direct-sales market.

For many buyers, Dell's enduring record for support and on-site service has earned the company an extra level of trust. You get a year of free on-site repairs; a 24-hour on-site repair policy; and 15 hours of daily, toll-free tech support. The Dell System 486D/20 may be priced beyond reach of the tightest budgets, but the flexible upgrade options ensure that if you buy it, you won't be facing instant obsolescence.

Dell lets you change your speed setting to support 486 CPUs from 16 MHz to 33 MHz.

Paper



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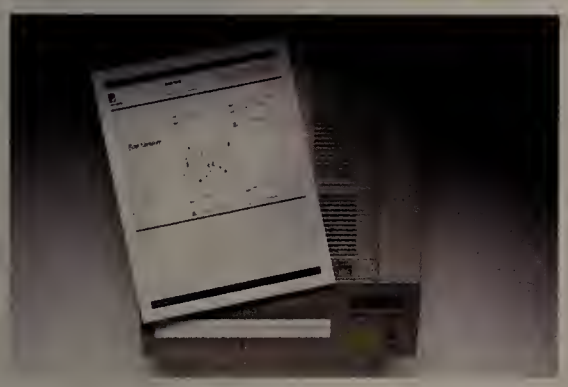
Retrieve.



To use PaperWorks, you don't have to touch a keyboard. Or click a mouse. Or even be near your computer.

You just check boxes and scratch notes on a special Smart Paper™ form. Fax that form to your PC. And PaperWorks follows your instructions.

Let's say that you're on a business trip in Seattle. Your PC is in your office in New York. And you need a document that's stored on your PC's hard disk.

You could call and have someone fax it to you. But what if it's late and everyone has gone home? Or what if you don't want people snooping through your files?

To get the document you need with PaperWorks, you simply pull a specially encoded PaperWorks Smart Paper form from your briefcase. Check a few boxes to indicate which document you want and the fax number where you are. Fax that form to your PC. And PaperWorks finds the document you want and faxes it back to you. And that's just a sample of what it can do.

Send.

Let's say you need to distribute a document to a dozen or so people. Some of them work in your office. Others are scattered around the country. Maybe you're in the office. Or on the road.

No problem.

Once again, you just check a few boxes on a Smart Paper form. You can have one box per person as well as a box that represents a distribution list that you want to receive the document. Fax the form and document to your PC and you're done.

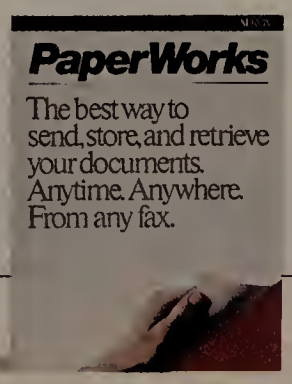
You take off to your next appointment. PaperWorks looks up the fax numbers and makes the calls to distribute everything for you. Automatically.

PaperWorks remembers instructions as well. For instance, you can store a price list now. And PaperWorks will fax it to your customers at night when rates are lower.

You can also give your customers their own Smart Paper Retrieve forms. And let them get just the documents they need, when and where they need them.

"This is the start of a very big idea."

—Paul Saffo, as quoted in The New York Times



Store.

Or let's say you're away from the office. And you need to store a document on your PC, such as a contract or sales results.

Easy.

Fax that document to your PC. And PaperWorks will store it in any hard disk category you indicate on your Smart Paper Store form.

PaperWorks software lets your fax card work for you no matter where in the world you are. If you're in Tokyo, no need to wait until the business day begins in New York. You can send memos, file reports and give instructions without worrying about time zones or people's schedules. You can even scratch handwritten notes on Smart Paper Send forms and have PaperWorks distribute them for you.

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What do you need to use PaperWorks? A 386 PC with 4 MB of memory and a hard disk with 20 MB free. Windows 3.0 or 3.1. One of the fax cards listed below. And something to print your Smart Paper forms on. Even an ordinary dot matrix printer or fax machine will do.

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And see if PaperWorks doesn't make you think of a piece of paper as a quarter-ounce pen computer.

PAPER WARE

System Requirements: 386SX, 386, 486SX or 486 PC with a mouse and a hard disk with at least 20MB free; 4MB RAM; Windows 3.0 or 3.1 and DOS 3.1 or later; Intel SatisFAXtion, The Complete Fax, The Complete Communicator, or CEI proFAX fax card.

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Dell System 486P/20

PROS: Flexible CPU upgrades, compact, highly integrated, fine support
CONS: Not much room for boards and drives, must pull 486SX to add doubler

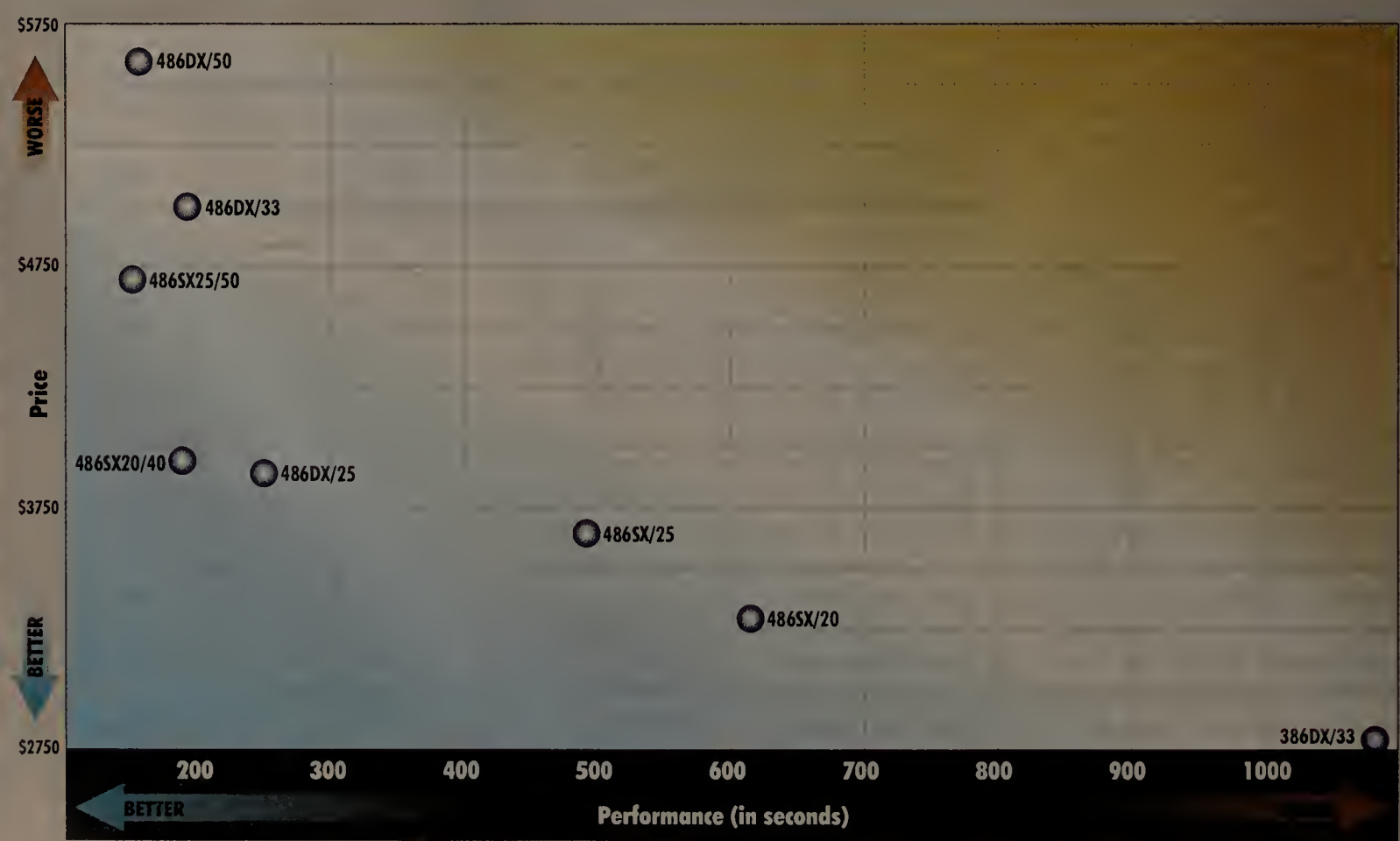
The System 486P/20 is a nicely integrated subcompact that would fit in best as a LAN workstation. The $2607 price is less than its big sibling 486D/20's, but you get just three expansion slots and three drive bays, and to install or replace the hard drive, you have to pull the power supply. Dell integrates the VGA, I/O, and IDE connector onto the tiny motherboard. If you need both standard floppy formats, you can ease the bay shortage by ordering a Canon dual drive for the one half-height 5¼-inch bay. As with the 486D/20, you get a 224-watt power supply, two floppy drives, and the jumpered clock.

Trust is hard won, and Dell has earned its market position. So if a box with a slim-line design—backed by a company with a great reputation—means more to you than a cut-rate price and big expansion capabilities, the System 486P/20 could be the workstation for you.

With limited room for peripherals, the Dell System 486P/20 would make a great network workstation.

20-MHz OverDrive Chip Beats 486DX/33

Losing track of the new processors and how they perform? To help sort things out, we took a modular ALR PowerPro system and set it up with eight different processors, including two of Intel's new OverDrive chips. Then we ran a CPU-intensive 1-2-3 benchmark and plotted the results against the list prices of the systems. In the case of the "clock-doubled" 486SX systems, we added the price of the original chip and the OverDrive chip. (We didn't add the price of any math coprocessors.) The table shows the results: On this benchmark, and with ALR's list prices, a 486SX/20 running at 40 MHz is faster and cheaper than a 486DX/33. A clock-doubled 486SX/25 running at 50 MHz is faster and cheaper than both a 486DX/33 and a 486DX/50.



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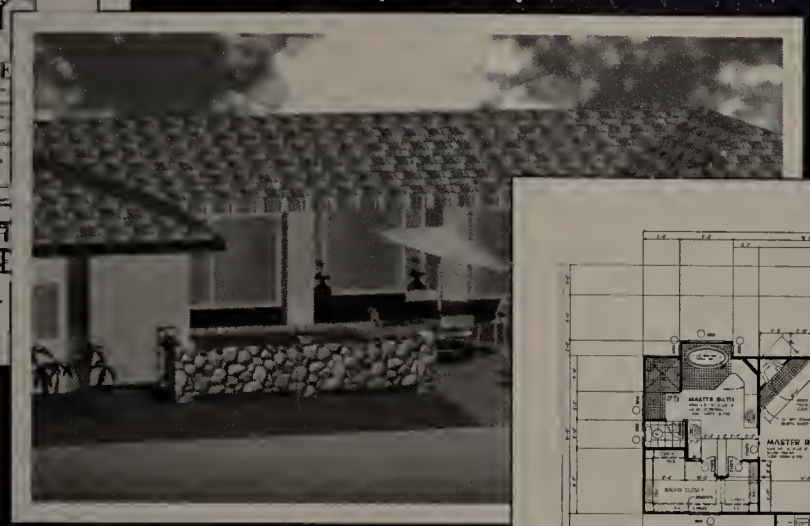
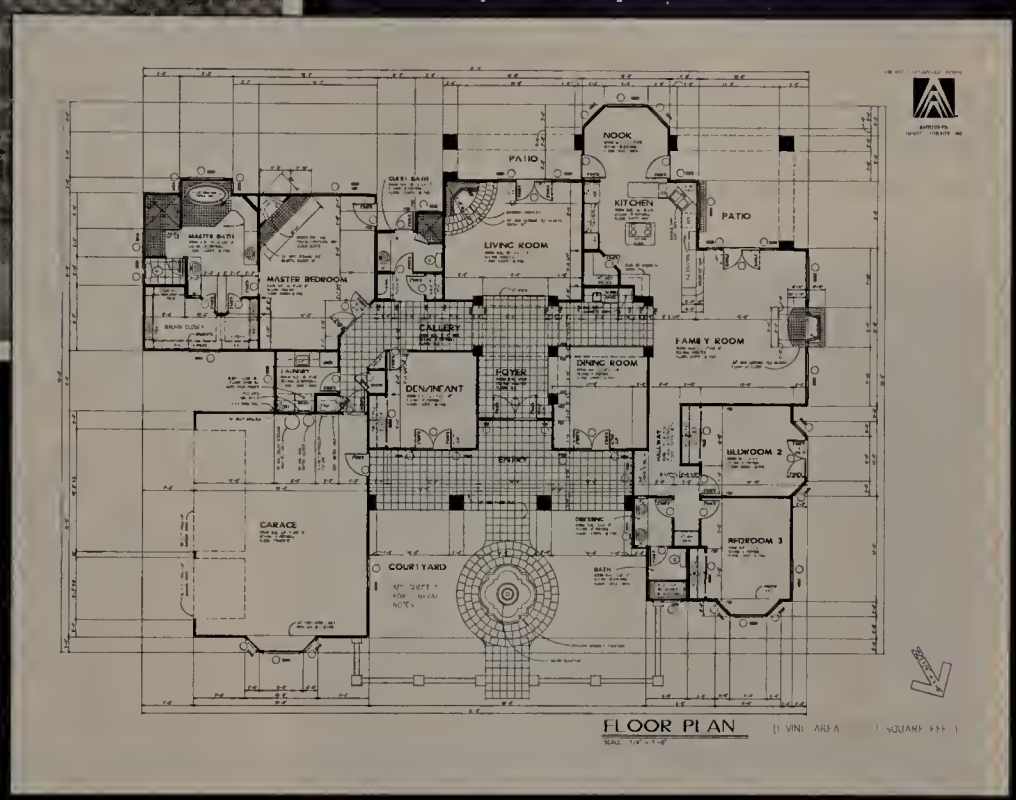
A-size (8.5"x 11")

B-size (11" x 17")



C-size (17" x 22")



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Everex Tempo M 486SX/20

★★★ **PROS:** Fast 1-2-3, dBASE, and Windows performance, lots of slots, CPU-card design, speaker switch **CONS:** Expensive, support line not toll-free, have to pull the 486SX to install a doubler

The modular Everex Tempo M 486SX/20 starts with a 20-MHz 486SX CPU. When you need more processing punch, you can get a 20/40-MHz doubler, or you can configure the system with either a 33-MHz 486DX module or a 50-MHz PX2 module. Consistent with its pedigree, this 486SX is quick. It ran near the front of the pack in the *1-2-3* benchmark both with and without the OverDrive; it also got great grades on *Windows* and *dBASE*.

The Everex is a full-size desktop with five front-accessible drive bays, a 130MB Seagate ST 3144A hard disk, and seven free expansion slots. Everex service and support are dependable, but you have to pay the toll to talk to a technician. Although its $3280 price is high, the Tempo is fast, beautifully engineered, and ripe with upgrade potential.

With the Tempo M's modular design, moving up to a faster CPU is a plug-and-play affair.

First's FCS 486SX/20 gives you an impressive nine storage bays, and its price is fantastic.

First Computer FCS 486SX/20

★★★ **PROS:** Best price and largest drive capacity in the roundup **CONS:** No on-site service, have to pull the 486SX to add a doubler, design has rough edges

The price is no misprint: You can buy a loaded First Computer FCS 486SX/20 for an incredible $1699! This roomy tower begs for applications that require multiple drives. First gives you nine bays, six of them accessible from the outside. Inside you'll find six free slots, a 120MB Quantum ProDrive LPS, and a 250-watt power supply. But getting the cover off is next to impossible, and the CPU socket is hard to get to as well: We had to pull the 3½-inch drive cage to install the OverDrive.

The First performed reasonably well overall, but even with its fast Orchid ProDesigner II SVGA card, it was slow on *Windows*. The service agreement includes a 48-hour repair turnaround policy. Unfortunately, there's no on-site service option, and you pay for tech calls. If shipping your PC back to the vendor for repairs doesn't bother you or you have your own tech resources, this lowball system will look awfully tempting.

Grid MFP/420s Model 120

★★★ **PROS:** Fast, good service and support, compact footprint **CONS:** Pricey, only three free slots

This fast, compact unit is ideal for LAN workstation chores. The MFP/420s comes with a 16ms, 120MB Quantum ProDrive LPS drive, and its performance is fairly spiffy. At 20 MHz, this system runs in fifth place. With an OverDrive chip installed it does almost as well, including a fourth-place finish on *WordPerfect*. However, at $3118, this speedster is not cheap.

Expandability is minimal—you get room for only three drives and three boards—but if you're hooked to a LAN and can count on server storage, that count is probably adequate. Service and support are decent: On-site service is available for $100 a year, tech support is toll free, and we got accurate answers—though on occasion we found it hard to get through. The bottom line? This is a fleet performer, but you can find faster, more expandable systems that cost a lot less.

The MFP/420s is not cheap, but you get impressive performance at both speeds.

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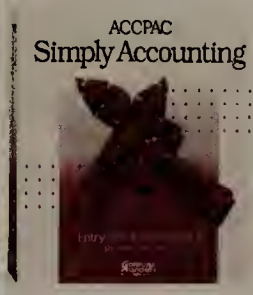

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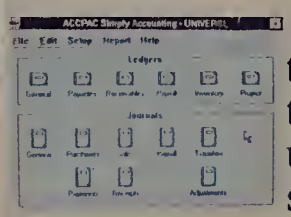

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PC WORLD TEST REPORT

20-MHz 486SXs: Quick Today—Quicker Tomorrow

Without the OverDrive upgrade, the Mitac, Acer 486SX, and IDS turn in the best scores.

OverDrive (20/40 MHz) 486SX (20MHz)

Methodology
We tested all the computers with 4MB RAM except the two ALRs, which had 5MB. The systems' hard disk size ranged from 120MB to 240MB. We used the vendor's version of DOS 5.0 or MS-DOS 5.0. With the native 20-MHz 486SX processors installed, we ran every test in our suite except *AutoCAD*, which will not run on a system without a coprocessor. Then we installed 20/40-MHz OverDrive clock doublers and ran all six tests, including *AutoCAD*. Test results are presented in order of fastest performance using the 20-MHz 486SX processor, with the exception of *AutoCAD*, where only OverDrive results were available.

1-2-3 2.2
We load the application, followed by three separate worksheets (arithmetic, financial, and scientific). We make various changes and run recalcs on each. Finally, we use the *MAPS* add-in from Management Advisory Services of Seattle to run a number of financial forecasts.

Windows 3.0
Timing begins and ends at the DOS prompt. We launch Windows along with a macro that loads *Microsoft Excel* with a financial worksheet and initiates a recalc. Then the macro loads Lotus's *Ami Pro* along with a 50K document that contains a 500K TIFF image. Finally, the macro launches *Micrografx*

dBASE IV 1.1

Mitac	BEST BUY	397 / 295
IDS	BEST BUY	412 / 271
AcerPower 486SX		424 / 291
Boss		440 / 298
Everex		442 / 302
Soft-Hard		443 / 301
Club American		444 / 303
ALR BusinessVEISA		454 / 317
Grid		455 / 344
ATronics		462 / 342
ALR BusinessStation		472 / 338
Dell System 486D/20		475 / 358
Dell System 486P/20		476 / 358
NEC		483 / 354
Blockship		493 / 374
Northgate	BEST BUY	495 / 354
Swan 486SX/20M		497 / 369
Touche		503 / 394
First Computer		504 / 366
Swan 486SX/20		516 / 420
AcerPower 386SX/486SX		544 / 442
USA Flex		564 / 440
Wang		575 / 401

seconds 0 150 300 450 600

Paradox 3.5

AcerPower 486SX		318 / 215
AcerPower 386SX/486SX		429 / 321
IDS	BEST BUY	510 / 390
Mitac	BEST BUY	558 / 459
ALR BusinessStation		559 / 438
ALR BusinessVEISA		560 / 437
Club American		563 / 436
Grid		583 / 468
Swan 486SX/20		620 / 518
Boss		629 / 504
Touche		630 / 513
Dell System 486P/20		639 / 526
Northgate	BEST BUY	640 / 512
Dell System 486D/20		640 / 528
First Computer		646 / 514
Swan 486SX/20M		646 / 519
Everex		656 / 532
Blockship		662 / 548
ATronics		664 / 563
Soft-Hard		667 / 544
USA Flex		677 / 554
NEC		680 / 570
Wang		721 / 562

seconds 0 188 375 567 750

AutoCAD 10

AcerPower 486SX		129
Club American		129
IDS	BEST BUY	133
AcerPower 386SX/486SX		137
Grid		143
ALR BusinessVEISA		146
Mitac	BEST BUY	158
Northgate	BEST BUY	161
Soft-Hard		164
First Computer		166
ALR BusinessStation		167
Dell System 486D/20		167
Dell System 486P/20		167
Swan 486SX/20M		171
Swan 486SX/20		172
Blockship		176
Touche		176
Boss		177
Everex		178
USA Flex		185
ATronics		187
NEC		194
Wang		196

seconds 0 50 100 150 200

Designer, opens a drawing, displays it on screen, and exits to DOS.

WordPerfect 5.1
We reformat three text files that vary in size from 5K to 55K. The files contain some boldface and underlining; one document includes a TIFF file.

dBASE IV 1.1
With the caching feature enabled, we complete an unindexed search for a single record in a 100,000-record parts table. Then we index the table, run the transaction processing module, and post 600 records.

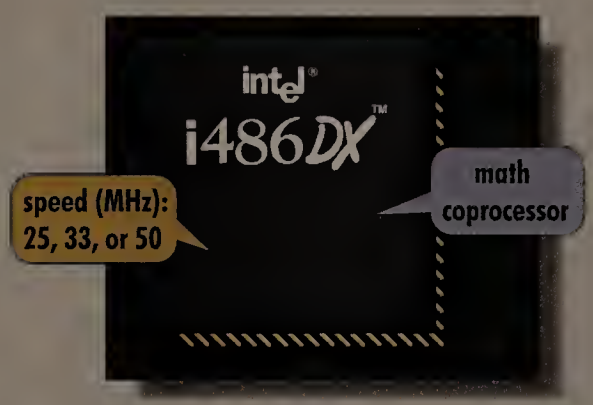
Paradox 3.5
Starting with an orders table, we compare each record with an available stock table. The application finds the current price for the items and inserts the resulting record into an invoice table. PCs with caching disk controllers tend to have a dramatic edge on this disk-intensive test. You can install a similar controller on any PC and reap a similar benefit.

AutoCAD 10
We load a 500K drawing. We then mask layers, change zooms, and remove the hidden lines.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

The 486 Family: Fast Company

The 486DX CPU processes at the speed of the system clock, whereas the 486DX2—the OEM version of the OverDrive chip—gives an average 70 percent performance boost by doubling internal processing speed. Many 486SX systems include a vacant upgrade socket; when you fill it with either a 487SX CPU processing at the clock rate or a double-speed OverDrive chip, you put out the lights on the coprocessorless 486SX CPU. As a result, many manufacturers are now using a universal socket that can accept any of these processors.



IDS 420S Power User Pro

★★★★ **PROS:** Fast, lots of room for boards and drives, 200MB drive **CONS:** On-site service costs $250 a year

With a four-star performance rating and a tempting $2345 price, IDS's Power User Pro is a fine overall value. It is the second fastest system we tested, thanks in part to its 64K external memory cache and a big (200MB) 15ms Western Digital Piranah drive. In 20-MHz mode this system took second place on *dBASE* and *1-2-3*. Drop in Intel's OverDrive chip, and you're looking at a first-place finish on *dBASE* and *Windows* plus second or third place on everything else.

You get seven free slots and five drive bays, and an easy-to-reach upgrade socket makes installing the OverDrive painless. Service and support are mixed: The company guarantees a 48-hour turnaround on repairs, but you pay toll charges on tech support calls, and on-site service costs $250 a year. Still, PCs like this are what the Best Buy award are all about.

PC WORLD BEST BUY

Fast, expandable, and affordable, IDS's Best Buy Power User Pro includes good service and support.

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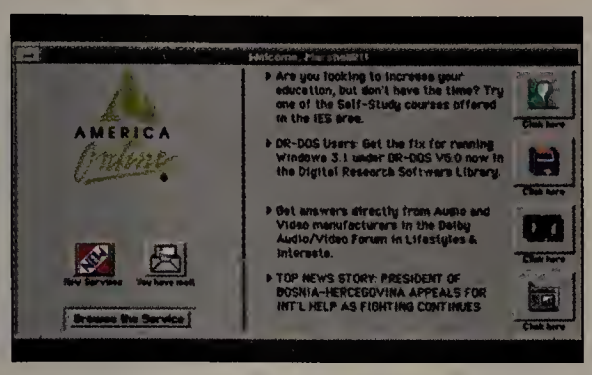
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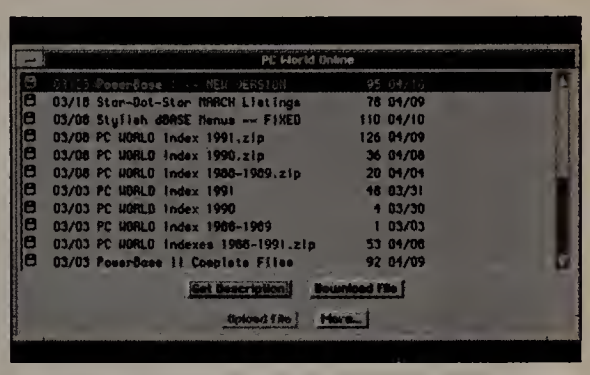
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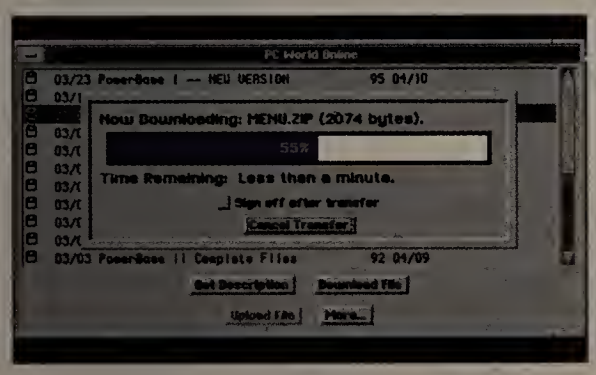
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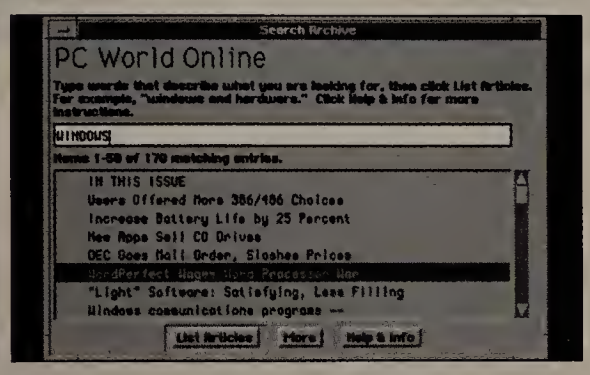
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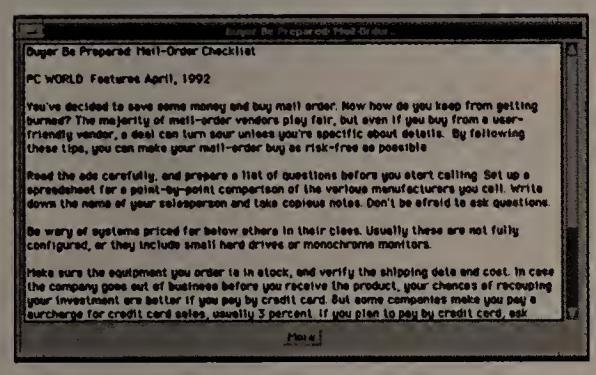
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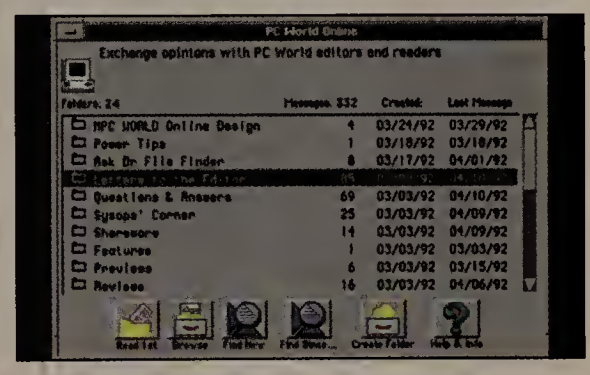
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Circle 207 on reader service card

Mitac 4270E

PROS: Fast, excellent service and support, 200MB drive, compact
CONS: CPU socket hard to access

Mitac's 4270E is aimed right at the CAD/CAM and desktop publishing markets—and that means speed. This EISA machine took first place overall at 20 MHz and third place overall at 40 MHz. It comes with Conner's 200MB 3204F drive, with 12ms average access time, so you'd expect it to be fast on disk-intensive applications. In fact, at 20 MHz it took top spot on *dBASE* and fourth place on *Paradox;* at 40 MHz it placed third on *dBASE*. And thanks to its direct-mapped write-back 64K cache it's no slouch on processor-intensive applications either; it won the *Windows* contest at 20 MHz and breezed into top place on *1-2-3* at both speeds.

The $2521 price is middle of the road, and service and support are tops. On-site service is free, tech support has an 800 number, and answers were prompt and accurate. The speedster with the oversize disk is worth every penny.

If you have a processing-intensive job to do, Mitac's Best Buy 4270E fits your PC profile.

Best of the Rest: 486SX/20s Coming Out of the Woodwork

486SX/20s may soon be replaced by 486SX/25s. But right now there are more than can fit in a review.

Model	List price [1]	Hard disk size	Fast-RAM capacity	Free 32-bit slots	Free 16-bit slots	Free 8-bit slots	Drive bays	Compact footprint	Warranty (months)	Available	Less than $100	Free
ALR Flyer 32DT 4SX/20	$2694	120MB	36MB	0	4	0	3	N	12	Y	Y	N
AMKLY Station 486SX/20	$3110	120MB	52MB	0	2	0	2	Y	12	Y	Y	Y
Aquiline WinJammer SX	$1595	120MB	64MB	0	5	0	6	Y [2]	12	Y	N	N
Ares 486/20-SX Sonic	$2475	120MB	64MB	1	5	0	7	N	24	Y	Y	Y
Axik Ace Cache 486SX-20 System	$1799	120MB	32MB	1	5	0	8	Y [2]	13	N	n/a	n/a
Bell 420 SXT	$2048	120MB	64MB	1	3	2	5	[3]	12	Y	Y	Y
Compudyne 486SX/20	$1199	105MB	64MB	1	5	2	3	Y	12	Y	Y	Y
CUBE 420ATX Upgradable System	$2890	120MB	64MB	0	5	1	5	Y	12	Y	Y	N
Dell PowerLine 420DE	$2948	120MB	96MB	6	0	0	5	Y	12	Y	Y	Y
DFI Model 420VSX	$2699	130MB	64MB	1	4	1	6	Y	12	Y	Y	Y
Eltech Model 4200	$1499	120MB	64MB	0	5	1	5	N	12	Y	Y	[4]
HD 486SX/20 System	$1745	120MB	64MB	0	7	1	6	Y [2]	12	N	n/a	n/a

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Axik Computer
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Bell Computers
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408/720-1967 (fax)
Reader service no. 782

Hewlett-Packard Co.
800/752-0900
Reader service no. 783

NEC PowerMate 486SX/20e Express Workstation

★★ 1/2 **PROS:** EISA, dual fans, three ZIF sockets, lots of slots and bays, upgrade path
CONS: Expensive

NEC's PowerMate 486SX/20e Express Workstation boasts three ZIF sockets: one each for the 486SX, the OverDrive chip, and a Weitek coprocessor. Expandability is stupendous too, and twin fans—a small one at rear of the power supply, and a big one to draw air over the slots—keep things cool. So why no Best Buy? The PowerMate has the highest street price in the roundup: $3782.

Despite a Conner 120MB 30104 drive (with 15ms average access time), performance fell in the bottom third. But you get five free EISA slots and five bays to add boards and drives, and the CPU is on a processor board for easy upgrade. The power switch and the keyboard and mouse ports are all located on the front panel where they're easy to reach. But for all its swell features, the PowerMate's price limits its appeal.

Three ZIF sockets make upgrading the PowerMate 486SX/20e Express Workstation a snap.

Model	List price [1]	Hard disk size	Fast-RAM capacity	Free 32-bit slots	Free 16-bit slots	Free 8-bit slots	Drive bays	Compact footprint	Warranty (months)	ON-SITE SERVICE Available	Less than $100	Free
HP Vectra 486s/20 PC Model 120	$2899	120MB	64MB	5	0	0	4	N	12	Y	Y	Y
IDS 420ST	$2445	200MB	32MB	0	7	1	5	Y [2]	12	Y	N	N
Key 486SX-20	$1995	125MB	64MB	1	5	0	6	Y [2]	18	Y	Y	N
Leading Edge D4/SX20	$2819	130MB	32MB	0	6	0	4	Y	[5]	Y	Y	Y
Packard Bell Executive 486SX	[6]	107MB	32MB	0	4	0	4	N	12	Y	Y	Y
Polywell Poly 486-20SX	$1750	120MB	32MB	0	8	0	8	Y [2]	12	Y	Y	N
Positive PC 2000	$2399 [7]	200MB	16MB	0	6	0	4	N	12	Y	N	Y [8]
Reply Model 32 486SX/20	$4880	200MB	16MB	5	0	0	5	Y	12	Y	Y	N
Silicon Valley SVC 486SX20	$1525	111MB	32MB	0	5	2	5	N	12	Y	Y	N
Soft-Hard PBS2 486SX/20	$1749	130MB	32MB	1	7	0	5	Y [2]	12	Y	Y	N
Tri-Star Tri-Win 486SX/20	$1695	130MB	32MB	1	3	2	4	Y	24	Y	Y	Y [9]
Twinhead Superset 600/420C	$1899	120MB	32MB	0	4	0	4	Y	12	Y	Y	Y
Wyse Decision 486si	$2448	120MB	64MB	0	5	1	5	N	12	Y	Y	N

[1] With 4MB RAM, 100MB to 210MB hard disk, 1.2MB or 1.44MB floppy drive, VGA and VGA color monitor, keyboard, mouse, DOS 5.0, and Windows.
[2] Tower.
[3] Two models available; desktop does not have compact footprint but tower does.
[4] Free for first six months, under $100 for the next six months.
[5] Your choice: 20 months' warranty on parts and labor, or 6 months free on-site service.
[6] Prices set by dealers only.
[7] With 8MB RAM.
[8] Free for first 30 days, more than $100 for next 11 months.
[9] Free for first 12 months of warranty period.

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Northgate Elegance ZXP

★★★★ **PROS:** Switchable clack, ZIF socket
CONS: Nat a tap perfarmer

While you can find faster systems, Northgate's Elegance ZXP boasts good performance. And this PC is superbly upgradable. The 486SX chip is mounted in a ZIF socket, and you can set the system clock for any speed from 16 to 33 MHz. That means when an OverDrive/33 chip is available from Intel, you could be looking at a warp-speed 66-MHz monster.

Naturally, given the tower case, slot and bay capacities are excellent. (The Elegance is also available as a desktop.) The ZXP we tested came with an Orchid video board and a 16ms, 120MB Quantum ProDrive LPS hard disk. And its $2649 price bundles a free copy of DiagSoft's *QAPlus*. Service and support include free on-site service, one-week turnaround, and toll-free tech support 24 hours a day, seven days a week. We recommend the upgradable Elegance ZXP without reservation.

PC WORLD BEST BUY

A combination of reasonable price and outstanding upgrade features makes the ZXP a Best Buy.

The PowerBox PBS1 486SX/20 boasts a great price and a keyboard with a built-in calculator.

Soft-Hard PowerBox PBS1 486SX/20

★★½ **PROS:** Inexpensive, twa flappies, Facus 5001 keybaard
CONS: Na an-site service

Soft-Hard's PBS1 tower costs only $2049, but you still get two floppies and a great Focus 5001 keyboard with built-in calculator and two function key layouts—a set of left-hand keys and another set across the top. Performance falls in the middle of the pack at both 20 and 40 MHz, despite a 64K cache that's upgradable to 256K. The PBS1 comes with a 15ms, 120MB Maxtor 7120AT drive and a Diamond Speedstar SVGA video board with 1MB of video RAM.

Expandability is solid, with seven free slots, six bays (three accessible from the outside), and a 2.5GB drive option. If you have to call long distance for tech support, a toll-free number will save you dough—and the number is staffed on weekends too. But on-site service is unavailable at any price, and there's no turnaround guarantee. If that doesn't faze you, this low-priced, expandable system is an extremely tempting value.

Swan 486SX/20

★★½ **PROS:** Nice price, twa floppies, fine service and suppart
CONS: Below-average perfarmance

Swan's 486SX/20 is one of the sweetest packages here. For only $2445 you get two floppy drives and a bundle of software that includes *Wealth-Builder, Quicken for Windows,* and *Microsoft Works for Windows.* The system we looked at included a 16ms, 120MB Quantum ProDrive—but while the 486SX/20 is designed to accept up to 256K of cache memory, no cache was installed in our test unit. Perhaps that's why it ran only mid-pack at 20 MHz and toward the bottom at 40 MHz.

Board and drive capacities are good: You end up with six free slots and four bays. The system has a two-year warranty and free on-site service, and the toll-free tech support line works weekends. When we called, the response was fast and accurate. Busy people will appreciate the option of using Swan's BBS or fax machine to get help with technical problems. If you can live without top performance, this system has a lot to offer.

Low price is a big plus for Swan's 486SX/20—and that $2445 includes a generous software bundle.

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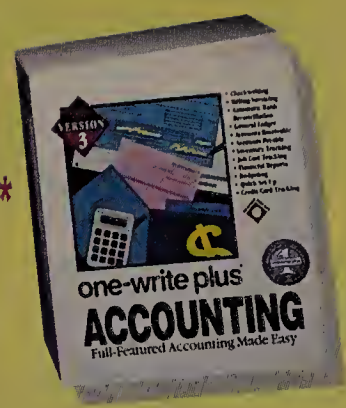

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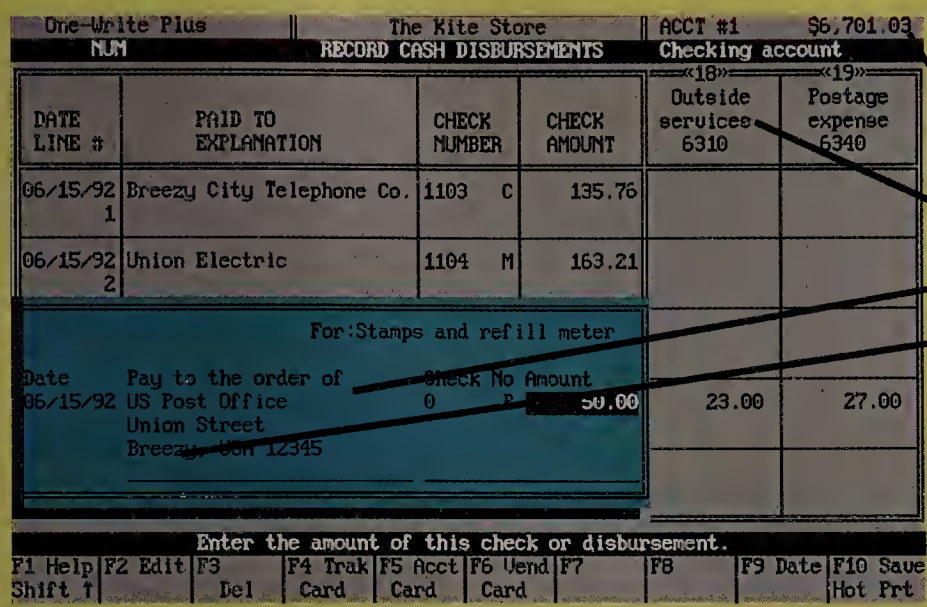

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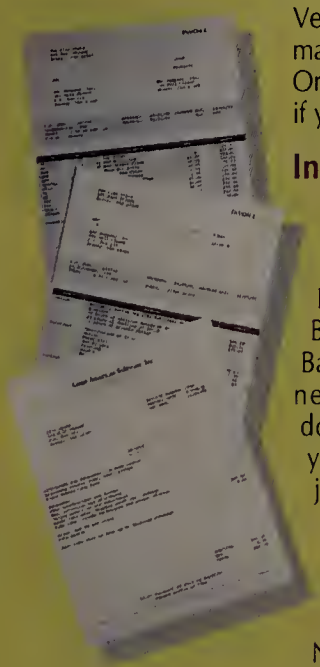
Press "Enter," and neatly print out all your checks with names and addresses from your Vendor file, on most dot matrix or laser printers. Or do checks by hand, if you prefer.



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System Requirements: IBM PC or compatible, MS-DOS or PC DOS version 3.1 or higher is required (3.3 or higher recommended). 640K RAM and Hard Disk. IBM compatible printer required.

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Circle 110 on reader service card

Swan 486SX/20M

★★ ★½ **PROS:** Two floppies, CPU board, fine service and support
CONS: Below-average performance

Swan's modular 486SX/20M is similar to its nonmodular 486SX/20—including being a solid value. There are only three significant differences between the systems: This modular unit is based on a CPU board, which means you get a broader upgrade path; it has five free slots—as opposed to the nonmodular system's six; and it costs $2520, $75 more than its nonmodular sibling.

A 128K cache was installed in the modular unit, but it seemed to make little difference: While the M ran a bit faster than the non-M on some tests, it ran a bit slower on others. Expandability is not quite as good as with the non-M: Not only are you down a slot to begin with, but one of the slots is limited to a half-length board. Otherwise the systems are identical, and despite the slightly higher price and tighter slot count, we think the CPU board upgrade makes the M the Swan to choose.

Swan's economy-priced modular PC, the 486SX/20M, offers an easy upgrade path.

If you're in the market for a tower at a painless price, Touche's 486SX/20 could be your dream machine.

Touche 486SX/20

★★ ★½ **PROS:** Inexpensive, two fans, cables labeled
CONS: Not a top performer

Touche's 486SX/20 tower is engineered for expandability: eight bays, seven free slots, and a hefty 300-watt power supply. The low-priced ($1999) system we looked at came with an oversized 240MB hard disk: Quantum's 15ms LPS 240. A 64K cache was installed as well, but performance isn't dazzling. At 20 MHz, Touche ran in the lowest third of the pack and close to the bottom on *1-2-3* and *WordPerfect.* With the OverDrive installed, its overall performance slipped to second slowest.

All the cables are neatly dressed with ceramic rings, and wires are clearly labeled (hard disk power, speaker, reset switch, and so on). Service and support are fine: The warranty runs two years, there's a 24-hour turnaround guarantee, on-site service costs only $29 per year, and tech support answers were fast and accurate. Despite its unremarkable performance, this superbly designed system is a real winner.

USA Flex 486SX 20

★★ ★ **PROS:** Inexpensive, two floppies standard, compact case
CONS: Slow, hard to access processor socket

USA Flex's 486SX 20 is *really* inexpensive: It costs only $1995, and that includes two floppies, a copy of *PFS:WindowWorks,* and a Western Digital Caviar 2120 120MB drive with 16ms average access time. But performance junkies better think twice. Despite a 64K write-back cache, this is the slowest unit in the roundup.

The system houses six free slots, and all five bays are externally accessible. Unfortunately, the cramped quarters make for a bit of an upgrade problem: You can't install the OverDrive chip unless you pull the 3½-inch drive bay that's blocking the 486SX socket. On-site service is free, and the toll-free tech support line works 24 hours day, seven days a week. But it wasn't always easy to get through, and the answers weren't always helpful. Adding everything up, the price is nice, but smart shoppers will note that the First, which is a good bit faster, can be had for $296 less.

The $1995 price on USA Flex's 486SX 20 is great, but the test scores may make you think twice.

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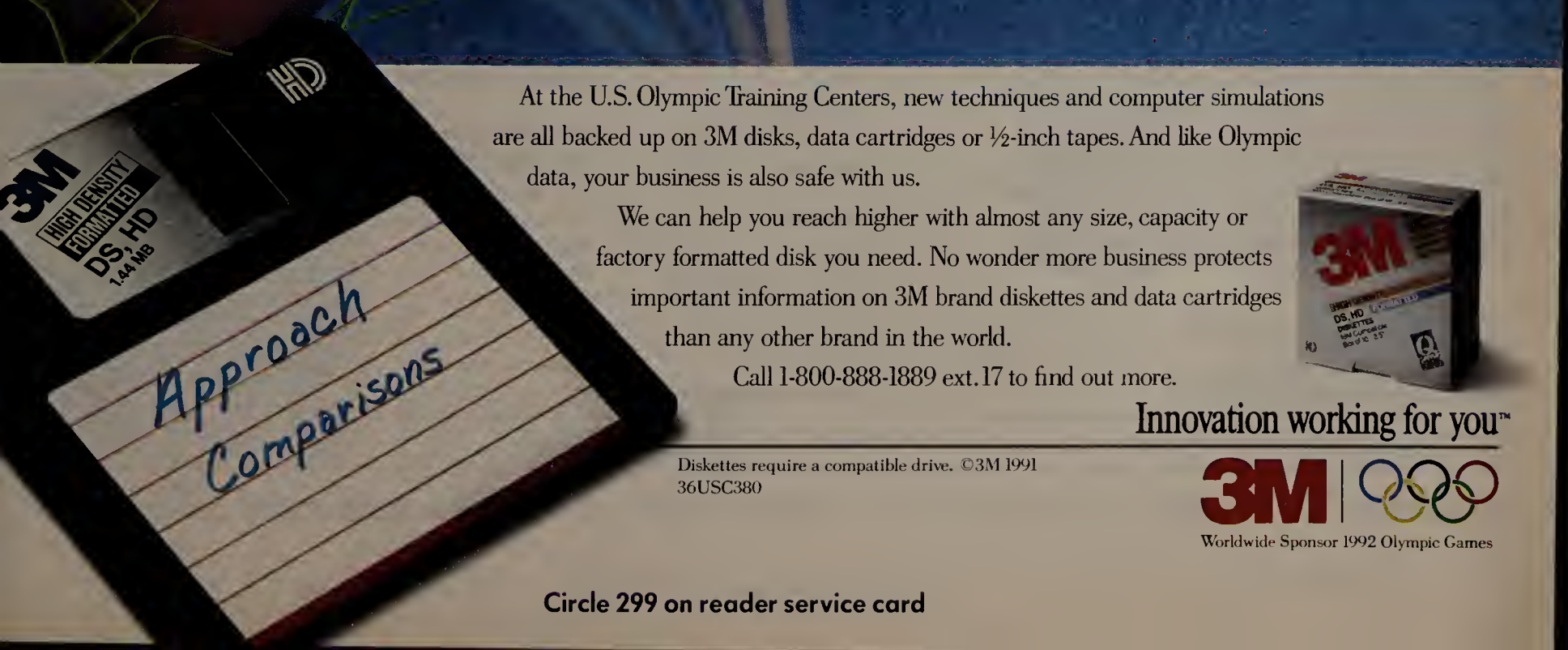

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Wang PC 441/20SC

PROS: Compact, great service and support
CONS: Expensive, poor expandability

At $2979, Wang's entry in the 486SX sweepstakes is fairly pricey, and it's one of the pokier systems here. It was the second slowest 20-MHz system tested and, perhaps due to the 16ms, 130MB Seagate ST3144A drive, it finished last on the disk-intensive *Paradox* benchmark. It did somewhat better at 40 MHz—including an impressive second-place finish on *1-2-3*. Improvements weren't nearly as dramatic on the other tests.

The mouse and keyboard ports are conveniently located near the front of the chassis, which can save you a lot of frustration with tangled cables. And the system is amply equipped with four free slots. On-site service is available (for $28 per month), 48-hour turnaround is guaranteed, and the toll-free tech line is available 19 hours a day. All our questions were answered accurately and swiftly. This is a solid system, but you can get a faster, more expandable PC for a lot less money.

Wang's compact PC 441/20SC has convenient mouse and keyboard ports to avoid tangled cables.

WHERE TO BUY

AcerPower 386SX
AcerPower 486SX
Acer America Carp.
2641 Orchard Pkwy.
San Jase, CA 95134
800/538-1542,
408/432-6200
Reader service no. 750

ALR BusinessStation 486ASX
ALR BusinessVEISA 486ASX
Advanced Lagic Research, Inc.
9401 Jeronima
Irvine, CA 92718
800/444-4257,
714/581-6770
Reader service no. 751

ATI-486/SX-20
ATronics Int'l Inc.
45635 Narthpart Laap E
Fremant, CA 94538
800/488-7776,
510/656-8400,
510/656-8560 (fax)
Reader service no. 752

Blackship BLK 486SX/20
Blackship Camputer Systems, Inc.
2031 O'Taale Ave.
San Jose, CA 95131
800/531-7447,
408/432-7500
Reader service no. 753

Boss 486SX/20 Cache
Boss Technology, Inc.
2546 N.E. Expressway
Atlanta, GA 30345
800/628-1787,
404/636-2126
Reader service no. 754

Club American Falcon 420 SX
Club American Computers, Inc.
3401 W. Warren Ave.
Fremont CA 94539
800/524-2582,
510/683-6688
Reader service no. 755

Dell System 486D/20
Dell System 486P/20
Dell Computer Carp.
9505 Arboretum Blvd.
Austin, TX 78759-7299
800/289-3355,
512/338-4400
Reader service no. 756

Everex Tempo M 486SX/20
Everex Systems, Inc.
48431 Milmant Dr.
Fremont, CA 94538
800/821-0806,
510/498-1111
Reader service no. 757

FCS 486SX/20
First Camputer Systems, Inc.
6000 Live Oak Pkwy.
#107
Narcrass, GA 30093
800/325-1911,
404/441-1911
Reader service no. 758

Grid MFP/420s Model 120
Grid Systems Corp.
47211 Lakeview Blvd.
Fremont, CA 94537
800/222-4743,
510/656-4700
Reader service no. 759

IDS 420S Power User Pro
Int'l Data Systems
12800 Garden Grave Blvd., Bldg. E
Garden Grave, CA 92643
714/530-8677,
714/530-0815 (fax)
Reader service no. 760

Mitac 4270E
American Mitac Corp.
410 E. Plumeria Dr.
San Jase, CA 95134
800/648-2287,
408/432-1160
Reader service no. 761

NEC PowerMate 486SX/20e
NEC Technologies, Inc.
1414 Massachusetts Ave.
Baxboraugh, MA 01719-2298
800/388-8888,
508/264-8000
Reader service no. 762

Northgate Elegance ZXP
Narthgate Camputer Systems, Inc.
7075 Flying Claud Dr.
Eden Prairie, MN 55344
800/548-1993
Reader service no. 763

Swan 486SX/20
Swan 486SX/20M
Swan Technalagies Inc.
3075 Research Dr.
State Callege, PA 16801
800/468-9044
Reader service no. 764

Soft-Hard PowerBox PBS1 486SX/20
Saft-Hard Systems Inc.
6301 De Soto Ave. #C
Waadland Hills, CA 91367
800/899-8269,
818/999-9531
Reader service no. 765

Touche 486SX/20
PC Pras/Touche Inc.
8205 S. Cass Ave.
Darien, IL 60559
708/810-1010,
708/810-9490 (fax)
Reader service no. 766

USA Flex 486SX 20
USA Flex
471 Brightan Dr.
Blaamingdale, IL 60108
800/872-3539,
708/351-9700
Reader service no. 767

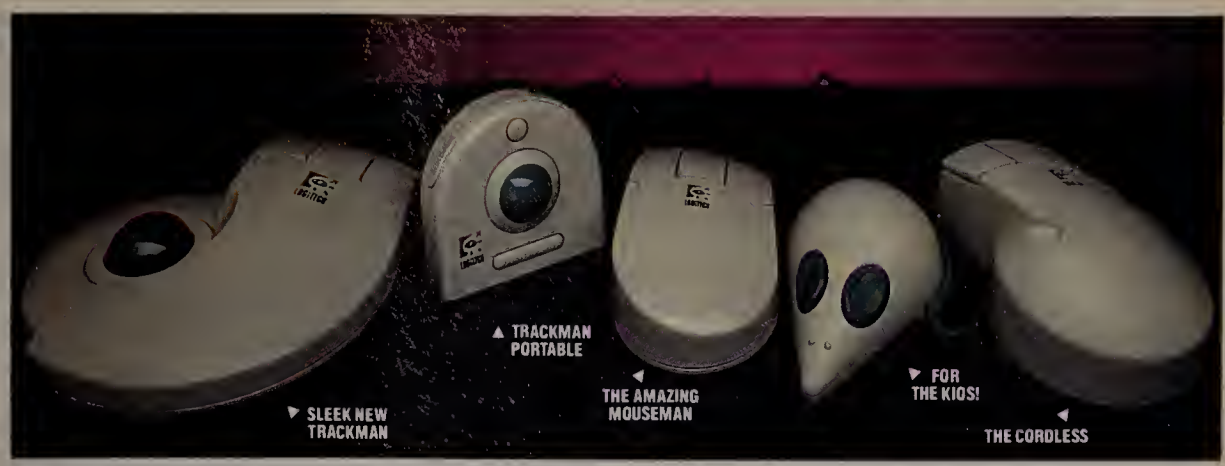
Wang PC 441/20SC
Wang Labarataries, Inc.
1 Industrial Ave.
Lowell, MA 01851
800/835-9264,
508/459-5000
Reader service no. 768

LOGITECH MICE

REVIEWER'S NOTEBOOK: *Here's the entire line of precision-crafted, meticulously engineered Logitech mice. Along with their cousins, the Logitech 256 grayscale scanner and the amazing FotoMan, these award-winning pointing devices cover every need. Our favorite is the sleek new Trackman, perfectly contoured to the human hand, enables you to work quickly, with streamline "glide-and-click" action. Great for desktop publishing and word processing — try it once and you'll never be able to use an ordinary mouse again.*

The advanced new Logitech 256 ScanMan remains the finest hand scanner you can buy. With its new "virtual page scanning" technology, you can scan a larger image than using a full-page scanner! And only the ScanMan delivers full 256 grayscale images, rich with brilliant detail. Nothing else comes close. Excellent instrument for graphic designers.

The Logitech FotoMan has become one of our biggest sellers, bringing digital photography to the PC desktop. Throw FotoMan into your briefcase and take pictures on the road — and instantly download them from the camera directly to your PC.



TrackMan

The TrackMan Stationary Mouse gives you the precision of a mouse, but stays still on your desk. Logitech, the world's leading mouse experts, designed TrackMan so your fingers rest comfortably on the buttons and your thumb easily controls the ball. This advanced design features an ergonomic shape which is angles to fit your hand for hours of extra comfort and productivity.

TrackMan Portable

Whether you're on the road or in the office, TrackMan Portable puts Logitech power and convenience in a format that's ideal for portable systems.

- Attaches to either side of a portable keyboard, so it requires no deskspace
- Small, lightweight and easy to handle
- Easily adjusted for comfortable use with either right or left hand
- Also comfortable and easy to use with your desktop system. Just plug in the 5-foot cable extension and start working.

MouseMan

MouseMan is not just another mouse. Designed with nearly a decade of mouse experience and the feedback of ten million users worldwide, Logitech's MouseMan is the next step in mouse evolution. Specifically tailored for you, in right-and left-handed versions, MouseMan provides maximum comfort, reliability and power.

Make Friends With Kidz Mouse!

Fun and smart, Kidz Mouse puts children in touch with their computer so they can learn educational programs, do their homework and play games. Kidz Mouse is a perfect fit for small hands, because it's designed specifically for children. Clicking the mouse button "ears" opens up a whole new world of computing for them.

The Cordless Mouse

The only problem with this new innovation from Logitech is that you'll have to get used to NOT POINTING IT AT YOUR MONITOR! The MouseMan is a cordless, three-button, radio-controlled mouse! No cables, no line-of-sight positioning! The radio receiver can be placed anywhere — even under your desk — and still allows you to work with precise movement. It's fully Microsoft compatible and includes Mouse-2-3, designed for maximum Lotus 1-2-3 productivity.

ALSO AVAILABLE

FIRST MOUSE

LOGITECH MICE

BCB2588	**TrackMan Combo**	**$89.00**
BCB2591	**TrackMan Portable**	**$99.00**
BCB2200	**MouseMan MAC**	**$89.00**
BCB2595	**MouseMan (Cordless Mouse)**	**$99.00**
BCB2596	**MouseMan for Serial & PS/2**	**$69.00**
BCB2589	**Kidz Mouse**	**$49.00**
BCB2587	**First Mouse**	**$49.00**

INSTANT DIGITAL SNAPSHOTS!

Introducing The Incredible New Logitech FotoMan...

REVIEWER'S NOTEBOOK: *What is it? In short, it's a portable, digital camera — for your computer. FotoMan takes great pictures with amazing clarity and 256 grayscale richness — then allows you to instantly download them to your PC. It includes a slew of image editing tools that open a world of creative opportunity, and is compatible with virtually all desktop publishing programs. The applications for this new technology are enormous. Insurance and real estate professionals are using it to expedite claims and transmit photographs of neighborhoods and homes. Manufacturers use FotoMan to quickly catalog products and parts, while law enforcement officials are using it to photograph suspects, crime scenes and evidence — without the time and expense of film.*

There are hundreds of practical uses for this new product, but we found FotoMan was also a lot of fun. It comes with an automatic flash, one-button operation and a field of focus from three feet to infinity. FotoTouch provides a sophisticated range of features including 256 grayscale editing. It's one of the hottest new ideas in computing: the digital photograph — taken by a small, portable and easy-to-use camera that allows instant transfer to your computer — without a digitizing board or other hardware.

In the past, getting a photograph into your PC meant using a traditional film method. The film would first be processed into either slides or prints, then scanned or stripped into your document. Now just snap a photo of a new employee, for example, and send it directly to the corporate database. Once the images are downloaded, FotoTouch shows you miniature versions so you can choose the image you want. When you've got your shot on-screen, the FotoTouch software allows you to easily make modifications. Then save your image in either TIFF, CCIT, BMP, PCX or EPS format. There's no film, no developing and no waiting!

LOGITECH FOTOMAN

BCB2592	**FotoMan**	**$629.00**

Call for requirements.

Merges Multiple Scans Together–Seamlessly!

When we first introduced the ScanMan Model 256 Grayscale hand scanner last year, it met with a roar of enthusiasm. We published the results of our testing — unbelievably sharp scans, with crisp, rich detail and 256 levels of gray. Scanning photos, illustrations — and text — was instantly taken to a new level. In head to head testing, we found the Logitech ScanMan Model 256 to be more versatile, faster and capable of producing large crystal-clear images. The 256 levels of gray add more depth and realism to all your scanned images. Logitech had created the ultimate hand scanner, the hottest new product of the year.

But when you work with Logitech, you come to understand that they never sit still. While the ScanMan Model 256 was sweeping the industry (*PC Magazine's* "Editor's Choice," *InfoWorld's* 1991 "Product of the Year," *PC Computing's* "Most Valuable Product of 1991"), they were at work designing an enhancement that would catapult it to another level entirely — a completely new category of scanners. The innovation: Virtual Page Scanning. The Technology: the Logitech Autostitching feature. It automatically "stitches" 2, 3, — even 4 scans together (so it can handle more area than an 8.5 by 11 flatbed scanner!). No other scanner we've ever seen can automatically merge scans into one completely seamless image. The ScanMan Model 256 smooths and de-skews the stitch, while evening the tones across the scans for remarkable images.

ScanMan Model 256 comes with Perceive Personal, one of the industry's highest-rated OCR software.

Now Just $329!

LOGITECH SCANMAN

BCB2593	**ScanMan Model 256 with Perceive**	**$329.00**

Please call for system requirements.

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On a standard data transfer performance test, FAST! is 18 times faster than a standard AT — and 5 times faster than the leading competitor. In fact, an IBM XT with FAST! is faster than a Compaq DeskPro 386!

SOFTWARE CAROUSEL

Imagine switching programs on your computer as quickly and easily as you change channels on your TV! No more 10 step routines just to exit one program to work in another. Just switch and you're in your spreadsheet for work on the budget. Switch — you're in your word processor to zip off a memo. Switch over to your database to add items to your mailing list and then just switch back to your spreadsheet — to the exact spot you left off!

DISK OPTIMIZER

Fragmentation kills hard disk performance. It causes excessive head movement across the media, creating bad spots throughout the drive. A fragmented hard disk, left unmaintained, is almost certain to crash. That means major data loss. Disk Optimizer 4.0's easy-to-use menus makes maintenance simple.

SUPERSTOR 2.0

This unique product, unlike conventional file compression software, employs sophisticated "on-the-fly" compression algorithms to expand the storage capacity of your drives (hard disk or floppy) by up to 300% — and in many cases more! You can store 2 to 3 times more on your hard drive without giving up speed with this new technology... old technology gives up speed to get space.

386MAX 6.0 New 386MAX 6.0 is the best memory manager on the market today. It recovers massive amounts of high DOS memory and does a *better* job of freeing conventional memory with advanced tools like these:

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- **VGAswap™** provides more contiguous memory by automatically relocating video ROM on all EGA and VGA systems.
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PCRx PCRx is the perfect anti-virus solution for notebook computer users or if you're computing in a Lan environment. The secret is a compact, 10K TSR filter that creates a virus behavior rule base which monitors virus characteristics and infection mechanisms, so PCRx predicts every possible move a virus can make before it infects! Even treacherous new strains are instantly spotted and conveniently removed with PCRx.

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Customizes policies to fit your exact needs. So easy-to-use, you can produce a finished employee handbook in as little as half-a-day.

POLICIESWRITE NOW!

PoliciesWrite Now! allows you to quickly establish personnel policies and avoid costly miscommunications. It is based on the highly successful Personnel Policy Expert, also from KnowledgePoint.

PoliciesWrite Now! is designed for use in small businesses where there's limited personnel staff and where quick results are a must. Choose any of the software's 66 policy topics, and read concise background information on the human resources and labor laws that affect your topic. Then answer the questions posed by PoliciesWrite Now! and watch it instantly custom-write your policies for you.

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Editing is fast with the built-in text editor. Or you can easily make final revisions with your own favorite word processor by exporting files to ASCII. All policies are dated for easy archiving, and PoliciesWrite Now! automatically creates a Table of Contents for you — no tricky word processing is required!

Don't put off writing or revising your employee handbook! PoliciesWrite Now! is the one tool that can help you get the job done *in as little as half-a-day.*

NOW AVAILABLE!

DESCRIPTIONSWRITE NOW!

This brand new title just released by KnowledgePoint, the makers of PoliciesWrite Now!, gives managers and business owners the practical business benefit of clear and complete job descriptions in minutes. Covering more than 2400 job titles, the program gives you the ability to locate and merge language to clearly describe essential duties for any job. DescriptionsWrite Now! then asks a short series of questions and uses the answers to custom-write text that describes the job's supervisory responsibilities, qualifications, physical demands, and work environment. It's simple, easy-to-use and helps you to:

- Be clear about hiring requirements before you write the recruitment ad
- Give new employees a clear understanding of the job and your expectations
- Compare your job descriptions with regional or industry salary surveys
- Comply with the Americans With Disabilities Act (ADA) and other employment laws.

Major Features

- **On-screen Human Resources Advice** – provides context-sensitive human resources advice on writing and using job descriptions
- **Search Options** – allows you to quickly find jobs within the Job Library by alphabetical, keyword, or job category searches
- **Merge** – allows you to locate and merge job duties from an unlimited number of job descriptions
- **Custom-writes** – asks questions and writes language to describe all functions and requirements of the job
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READ THIS BEFORE YOU BUY A CD-ROM READER ANYWHERE ELSE!

PUBLISHER'S NOTE: I've noticed lately that the CD-ROM market is not only getting big — but also very tricky as well. In fact, I'm annoyed at my competitors who market no-name drives at ridiculous prices like $199...

Those drives have incredibly low response times, and do not include the latest in laser technology. Will the interface be 100% compatible with your computer? They must get a lot of returns on those things. The offers are tricky, too. First I buy a reader, then I pick two CDs from page 4, row 8, then I pick from Page 11, third column — each pick costs me more money... by the time you're done, you've spent $1000 for an off-brand!

That's why we offer the NEC line of quality crafted CD ROM readers — and made the offer very simple. Everything's included. One price. Complete interface kit, a convenient CD caddy for neat, organized storage, a pair of Koss premium sound stereo speakers, stereo headphones and TEN TOP-SELLING CD TITLES! After all, what good is a reader without some tasty software to use with it? The NEC CDR 36 and CDR 73 are the best in the business, packed with advanced technology and a 100% guarantee from Tiger and NEC — names you know. In fact, our "No Down Time Guarantee" protects your reader forever.

You simply pick either the ultralight, ultrafast portable CDR 36 or the firebreathing CDR 73, the industry's premier speedster. Prices start at $599 and that's a massive value for that price. Compare! Really, take a look at the offers and you'll see that TigerSoftware is the most intelligent way to get into CD-ROM.

But there's one thing I left out. Something that makes TigerSoftware's offer absolutely irresistible: It's called *CD Speedway*, and it speeds up your CD-ROM reader by up to 1000%! Now your sleek NEC reader will run even faster! As fast or faster than your hard drive!

Now who's CD-ROM offer looks better? Oh, by the way *CD-Speedway* is brand new technology, exclusively available from TigerSoftware. You won't find it anywhere else. It's just one more way that Tiger delivers unparalleled value.

THE SOFTWARE LIBRARY INCLUDES:

Great Cities of the World. I personally found Great Cities of The World fascinating, it's packed with information on hotels in Paris, entertainment in New York, bull fights in Madrid and shopping in London. This multimedia guide covers tours by noted travel writer Jan Morris and information on culture, restaurants and shopping.

National Geographic Mammals: A Multimedia Encyclopedia. Switch to National Geographic's *Mammals* and see animated sequences and full-color photos of everything from an aardvark to a zebra. A magnificent CD-ROM title that allows you to see and hear animals in their natural habitat. Contains both volumes of National Geographic's renowned work.

Software Toolworks Multimedia World Atlas. From there, explore the earth's geography with *The Software Toolworks World Atlas.* This remarkable package contains the most extensive collection of full-color maps you'll find anywhere.

The TIME Magazine Almanac. Need some hard facts about the economy? Sports? Politics? Open the TIME Almanac and get the answers from one of the most respected sources — TIME Magazine. Nearly 5,000 articles covering the major events of the 20th century. A great reference tool for home or business.

The Time Table of History: Science and Innovation. Or, slip in the *Time Table of History: Science and Innovation.* More than 6,000 interrelated entries show the chronology of historical, scientific and technological events from the beginning of time to the present.

The Toolworks Illustrated Encyclopedia. Critically acclaimed and widely used, *The Toolworks Illustrated Encyclopedia* features the entire text of a 21-volume encyclopedia (9 million words) — stored on a single compact disc! Allows searches by title, word, or phrase of the latest information on science, contemporary life, law, sports, and much more.

Battle Chess. For fun, try *Battle Chess* — it's chess as you've only imagined it! An entire medieval world is at war, and your pieces are more than rooks and pawns... they are moving knights, foot soldiers, and regal kings and queens.

Amplified Stereo Speakers. With free stereo headphones and a pair of Koss SA/30 amplified stereo speakers, you'll actually hear the sounds of the world when you slip in a CD — whether on CD Bundle software or conventional audio CDs.

Demand Only the Best Equipment and Don't Pay More! The NEC CD-ROM players are perhaps the most incredible breakthrough in information technology. And these are not off-brand, second rate readers like you'll find in other catalogs.

"No Down-Time" Guarantee. It's Tiger's iron-clad guarantee to our customers. If your NEC CD-ROM reader ever fails to perform, we'll send you a new one on the spot.

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BCB8373 **CD Bundle w/CDR-36** **$599.00**
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Requires IBM PC, XT/AT, PS/2, or 100% compatibles; minimum 640K available RAM; hard drive (minimum 5 MB available space); VGA graphics adaptor; DOS 3.3 or higher and at least one floppy disk drive (5¼" or 3½"). Mouse recommended. Please specify XT/AT, PS/2, or parallel SCSI interface kit.

Sorry, free shipping is not included with these items. No returns.

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The Intelligent Road Atlas For Your PC!

Planning a vacation? Heading out on the road on business? Now there's a system that helps you plan any road trip for fastest, shortest or most convenient route — right on your computer screen.

Clear, detailed maps that can get you anywhere in the United States that you want to go. Just tell AutoMap where you're going, when and where you'll be starting from, what areas you'd like to avoid, what areas you'd like to visit on the way and how you like to drive.

Take Me Home, Country Road.

One of the great joys of automobile travel is just takin' it easy and seeing the country. I used AutoMap recently on a family trip to chart a course through the Carolinas. We had a long list of things we wanted to see and we wanted to do it all without getting on a super highway.

Just select your starting point, end destination, and areas to visit and let AutoMap create a detailed map of your next trip!

We threw it all into AutoMap and instantly had detailed maps, printouts and directions. AutoMap provided several different routes that would let us all do exactly what we wanted. It gave us travel times, mileage, information on hotels and the parks themselves. AutoMap also provided information on the cities we wanted to visit. What a great vacation planner!

ALL NEW! AUTOMAP EUROPE.

Scope Out The Autobahn — On Your PC.

REVIEWER'S NOTEBOOK: *Just Released! Tiger is proud to be among the first to have AutoMap Europe in stock and ready to ship. The makers of AutoMap have created the definitive guide to discovering Europe by car. AutoMap Europe is perfect for sightseers, student travelers, business planning or that once-in-a-lifetime vacation. Over 250,000 miles of motorways.*

BUY AUTOMAP–GET USA ATLAS FREE!

AUTOMAP

BCB4098A **AutoMap** 3½"	**$69.95**
BCB4098B **AutoMap** 5¼"	**$69.95**
BCB4106 **AutoMap Europe** Dual	**$99.95**

Hercules, CGA, EGA, VGA, 512K RAM, hard disk, mouse recommended.

Do You Know How Your Car Works?

REVIEWER'S NOTEBOOK: *Unless you're an auto mechanic, you probably have no idea how a fuel injection system works, how a transmission works, how a car's suspension system operates — or even how the ignition actually operates. It's quite interesting...*

The automobile is a masterpiece of engineering. Today's cars are filled with fascinating mechanisms, systems and ingenious devices. AUTOWORKS examines the automobile from bumper to bumper: from a basic overview of each system, to in-depth graphics and explanations of how your brakes, belts and suspension work. Animated sequences illustrate your automobiles components and detailed diagrams are everywhere.

Just a few minutes and you'll be hooked. You'll want to know how your gas gauge and speedometer works, your engines' lubrication system, pistons, your air conditioner, brakelights, alternator — everything!...Also a great education on topics like emission control, ethanol fuel, electric cars, diesel engines, turbochargers vs, superchargers, rustproofing, unibody construction, auto safety standards, and more. Sit down with AUTOWORKS before you start looking for a new car and know what you're buying.

AUTOWORKS is like having the ultimate owner's manual for your car. You'll find out exactly how the power generated by your engine (through combustion) is transferred from the crankshaft, to the drive train and on to actually turn the wheels. It's an amazing design feat. See how the gears work deep within the transmission's housing, and the gearbox controls the delivery of power to the drive shaft. Find out how the internal combustion engine creates all that horsepower. Even the most complex part is exploded and explained. Which means you can learn as much as you want about how a car works — down to the tiniest technological marvel.

AUTOWORKS

BCB4104 **AUTOWORKS**	**$79.95**

The Solar System On Your PC.

REVIEWER'S NOTEBOOK: *An explosive new hit title. Sometimes you take the dazzling beauty of our planet, our solar system — and if we dare imagine — the universe. Since the early astronomers aimed their primitive telescopes toward the sky, man has worked with curious passion to understand how the universe began, how it sustains itself — and what its future holds for its only (known) inhabitants. Orbits will ignite your family's interest in the nature of our universe. Packed with facts, brimming with vivid illustrations and interactive simulations.*

Orbits is a brilliantly interactive space simulator and comprehensive space atlas that brings the universe to your PC! Spectacular 3-D graphics demonstrate the operation of our solar system. Animated sequences show you the effects of gravity on various planets, the movement of the sun and moon. Compare the planets' characteristics, structure, chemical makeup and more. Simulations of eclipses, nuclear processes of the sun and the life of comets. View actual satellite photographs from NASA and the Jet Propulsion Laboratory, watch a spectacular presentation on the birth and death of the sun. See the interior structures of the sun and moon, create reports and comparisons on anything, and play a few rounds of Orbit-Trek, the built-in brain teaser. A great educational tool, Orbits is also an entertaining way to spend some time with your PC. It brings the stars, the planets and beyond — into focus.

Orbits is packed with so many intriguing, colorful screens and great information that it's hard to stop. It has been meticulously researched, the graphics professionally prepared. More than an astronomy program, Orbits takes you to the wonders of the universe — and gives it an interesting spin! For instance did you know... where a world shaped like a peanut exists... or where a storm that could swallow our entire Earth has raged for over 300 years... or where two moons may actually exchange orbits? These places are real, and on a cosmic scale they are really not so far away.

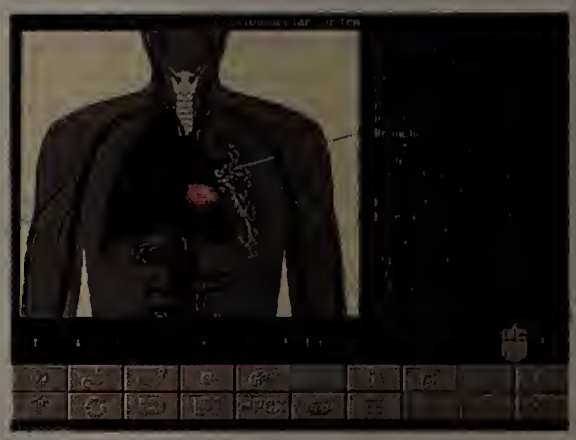
This is a great program for students — even smaller children enjoy learning about the heavens. A fascinating new title that's fun.

ORBITS

BCB4103-5 **Orbits** 5¼"	**$59.95**
BCB4103-3 **Orbits** 3½"	**$59.95**

A Guided Tour of the Human Body.

The human body. A perfect machine. It grows and develops, protects and heals itself and is designed to last for decades. Now the wonder of the body is combined with the power of the PC to produce a fascinating journey into its structure and functions. You'll see detailed, full-color graphics of the entire human body and a comprehensive database of facts, descriptions and explanations. Do you know the exact function of the hypothalamus? How about the kidneys? How do bruises heal or your brain work?



Experience a world of knowledge and beauty that provides profound insight into life itself. It's called BODYWORKS, and it could be the most interesting software program you'll ever own — perfect for students, artists and hobbyists.

Since your body doesn't come with an owner's manual, BODYWORKS is a great way to learn and understand how it operates. Its elegant design and high quality color illustrations are as good as any we've seen.

We've seen a great interest in schools for products like BODYWORKS, where so much data is at the user's fingertips. It's a faster way to learn, and since it is highly visual, the information is easier to understand. In fact, curiosity is all you or your child needs to embark on an amazing voyage inside the human body.

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Discover fascinating secrets about the 108 elements in the Periodic Table.

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BODYWORKS/CHEMISTRY WORKS

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BCB4101-3 **Bodyworks** 3½"	**$59.95**
BCB3861-5 **Medical Bundle** 5¼"	**$99.00**
BCB3861-3 **Medical Bundle** 3½"	**$99.00**
BCB4102 **Chemistry Works** Dual	**$69.95**

Novell's Do-It-Yourself Network In A Box.

The Complete 2-PC Network Starter Kit; Includes Ethernet Cards!

REVIEWER'S NOTEBOOK: *Everything you need is in one box — a sensational way to break into productive the world of peer-to-peer networking. Take any two computers — add NetWare Lite — and you can share files, applications, hard disks, peripherals and printers — all with the blistering speed of Ethernet. And NetWare Lite is simple to install, use and administrate. Smaller businesses can now enjoy the advantages of 100% Novell networking (and make no mistake, they're the industry leaders), without a dedicated server, extra RAM or any worries at all.*

Everything for simple, do-it-yourself installation is in the box: 2 Ethernet adapter boards, 2 NetWare Lite Software Nodes, a complete installation guide and Videotape, 2 T-connectors, 1 Terminator kit and a heavy duty 20-inch RG58A/U coaxial cable. All you need is a screwdriver and about fifteen minutes... just follow along the the videotape that comes with NetWare Lite...

Expanding NetWare Lite is easy: add a PC to your office and purchase another low-cost node. Buy just what you need when you need it. NetWare Lite will support up to 25 networked computers.

One note about speed and security: Novell's technology leads the industry in data transfer speed. The NetWare IPX network protocol is the fastest, most reliable in the business. Security is another Novell hallmark, featuring encrypted passwords, access restrictions and assigned privileges that keep curious eyes away from your critical files.

Complete And Do-It-Yourself.

What happens in a small business when two computers begin to fight for printers, hard disks and applications? Frustration usually runs high while productivity slumps. Those computers are screaming to be networked. By connecting your standalone PCs, you can avoid buying new laser printers, extra storage and memory. Networking is several years old now, but the small to medium size business never had the right solution available — until now.

As your network grows, you'll want to keep track of network activities and spot and errors immediately. Novell wrote the book on network management — and has built it into NetWare Lite.

Why Network My Computers?

An office environment changes when PCs are connected. An office full of standalone PCs keeps people apart, not communicating. But when those PCs can share files, an entirely new vista for productivity is opened. Ideas are crystalized, errors are caught, new ideas flourish. NetWare Lite's electronic messaging system allows users to talk to each other anytime — even when they're not together. You'll eliminate redundant tasks and needless paperwork. Copy information and send it — even scan magazine articles and pass them along. That's the future...

NetWare Pours On The Speed...

Some other networking systems rely on alternative technologies to provide a network solution. And while they may deliver adequate functionality, they'll never turn on the afterburners like Ethernet can. Your data clips along at 10 megabytes per second! And unlike the others, NetWare Lite requires very little RAM. In fact, your DOS programs will run without the need for additional memory. NetWare Lite contains a read-ahead disk caching system — built right in — for even faster transfer speeds.

Free VideoTape Makes Installation Fast, Too.

As if installation isn't easy enough, Novell has prepared an installation videotape that gets you going fast. Basically it's a 1,2,3 process: 1. Insert the installation disc into your computer; 2. Install the Ethernet controller cards; and 3. Quickly connect the cables. That's it.

NETWARE LITE

BCB3304 **Netware Lite** **$485.00**
BCB3303 **Additional Node** (One additional computer) **$279.00**
IBM PC, XT, AT and compatible PCs, all IBM PS/2 models, 25KB workstation PC RAM, 50KB server PC RAM and DOS 3.x, MS-DOS 5.0, DR DOS 6.0.

Timeslips® 5 Turns Time Into Money.™

The Most Comprehensive Time And Expense Tracking System You Can Buy.

Timeslips 5 is the latest version of the most successful, widely used time and billing program available today. Designed to help you better manage and control your business. Determine which clients and projects are profitable, and see where your hours are going. New features include multiple billing rates, work-in-progress reports, Client and User History reports including year-to-date and inception-to-date figures, and a redesigned security system. The Single User Edition records time and expenses for up to eight people. The Enterprise Pack supports two simultaneously networked stations and records time and expenses for up to 250 people. The Enterprise Expansion Kit adds three networked stations to your Enterprise Pack.

Timeslips 5 is the perfect system for:

Law firms, Accountants and CPAs, Architects, Advertising agencies, Design firms, Engineers, Project managers, Consultants, Public relations firms, Construction managers, Financial planners, Photographers, Psychologists... any service company.

- Time and expense tracking
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- Customized invoices with definable bill formats
- Multiple copies of each bill or report
- 15 custom client fields store more information per client for enhanced sorting, subtotaling and reporting purposes
- Up to six billing rates per user, per client, and per activity
- Supports Canada's Goods and Services Tax (GST), European date format, and keyboard entry of all French characters
- Bill each matter/project on separate or consolidated bills
- Maintain separate receivables for each matter/project

FREE With Timeslips 5:

PercentEdge and TS Speller!

TIMESLIPS 5

BCB3300 **Timeslips 5** with PercentEdge & TS Speller **$199.95**

THE MEMORY SHOP

REVIEWER'S NOTEBOOK: *Memory is a hot topic. It seems like everyone wants to upgrade their system by adding SIMMs, or upgrading the memory on their laser printer. But there's a lot of confusion about what they actually need and how much it should cost. Then there's the issue of the quality of the memory itself — it's not all the same. Some "dirt-cheap" memory chips are, well...unreliable, to put it mildly. I wouldn't put it in my machine, and I wouldn't want you to install it in yours...*

When you call TigerSoftware, you'll speak to someone trained specifically by leading hardware manufacturers to help you choose the right memory for your system and offer helpful hints on installation — it's easy! Just tell us what kind of machine you have, what applications you run — and we'll outfit you with the best possible memory upgrade. The Z-COM line of memory products all come with simple, understandable instructions that take the fear out of doing it yourself — today's machines are actually designed for simple memory upgrades. And Z-COM memory is the best in the business. They make memory for some of the industry's top names. Would Apple, Compaq, HP, IBM, Sun, Sharp, Toshiba and a host of others put their trust in anything but the best?

Z-COM

BCB6430 **SIMMS 256MB × 9MB 80ns** **$14.00**
BCB6431 **SIMMS 1MB × 9 80ns** **$48.00**
BCB6432 **SIMMS 1MB × 9 70ns** **$50.00**
BCB6433 **SIMMS 1MB × 9 60ns** **$52.00**
BCB6434 **SIMMS 4MB × 9 80ns** **$178.00**
BCB6435 **SIMMS 4MB × 9 70ns** **$179.00**
BCB6436 **SIMMS 4MB × 9 60ns** **$199.00**

Z-COM MEMORY UPGRADES

For AST Systems

BCB6437 **1MB for AST Premium 386C, 386/16** **$99.00**
BCB6438 **1MB for AST Premium II 386SX20, 386SX16, Cupid-21, AST Premium 386; 25 & 33** **$59.00**
BCB6439 **1MB AST Executive Notebook** **$72.00**

For Compaq Systems

BCB6440 **1MB for DeskPro 386/20e, 20, 25e & 25** **$80.00**
BCB6441 **1MB for SLT/286** **$89.00**
BCB6442 **1MB for Portable LTE/286** **$93.00**
BCB6443 **1MB for Portable 368S/20** **$179.00**

For Hewlett Packard LaserJets

BCB6444 **1MB for LaserJet II & IID** **$85.00**
BCB6445 **1MB for LaserJet IIP, III & IIID** **$80.00**

For IBM PS/2

BCB6446 **2MB (expandable to 14MB) Add-on Board for Models 50, 50Z, 55SX, 60, 65SX** .. **$267.00**

For Toshiba Laptops

BCB6447 **1MB for Portable T1000SE, LE & XE** **$119.00**
BCB6448 **2MB for Portable T3100SX** **$119.00**
BCB6449 **2MB for Portable T3100E** **$119.00**
BCB6450 **2MB for Portable T3200SX** **$119.00**
BCB6451 **2MB for Portable T5100** **$119.00**

SIMM Modules have a 5-year warranty; all other memory carries a lifetime warranty.

Personal TIME MANAGERS

BY PATRICK MARSHALL

You may *look* calm while juggling a dozen projects. But behind that facade is a harried manager with too much to do and not enough time to do it. You can't expect to close a deal or win a contract bid if you miss a key meeting or blow a deadline—and if your daily calendar or appointment book is a morass of Post-it notes and illegible scrawls, you're courting disaster. That's why you need a scheduling program.

At first glance, most scheduling programs appear to work much like their paper equivalents: You enter appointments into a daily planner, specifying dates and times. Of course, electronic schedulers do much more, or this article wouldn't be worth reading.

Probably the most attractive feature is the capability to set recurring appointments with just a couple keystrokes—say, a regular Friday morning meeting for the entire year. Most schedulers also offer a graphic time line that lets you see the nearest block of free time at a glance; all but two print out calendars in a variety of formats. What paper calendar serves up your schedule in daily, weekly, or monthly views? Or buzzes you a few minutes before your next appointment?

FED UP WITH SCRIBBLING, ERASING, FLIPPING PAGES, AND SCRIBBLING AGAIN? THESE PERSONAL CALENDARING PROGRAMS HELP YOU STAY ON TOP OF A FAST-PACED, EVER-CHANGING SCHEDULE.

ILLUSTRATIONS BY JEFF KOEGEL

Time management is so crucial to productivity, you'll find electronic schedulers in all kinds of software. Some are just one component of personal information managers (PIMs), all-purpose utility packages, or network-based project managers. We focused on products that offer personal scheduling for under $200, and we've come up with the seven top contenders. (If you're interested in slightly pricier programs that do more than scheduling, see the sidebar "Scheduling and a Lot More.")

All seven products can keep your appointments straight, and several come with such extras as phone dialers or network scheduling. But this is no features war. Schedulers are typically the third or fourth application you learn, so a short ramp-up time and hassle-free appointment changes are imperative—otherwise, your new scheduler will wind up on the shelf. In addition, because your appointments are often tied to phone contact, we've given extra credit to packages that include integrated address books and phone logs.

Because schedulers have different strengths and appeal to different users, we picked a whopping three Best Buys from the seven products reviewed. *On-Time for Windows* wins a Best Buy simply because it's so easy to learn and use, though it still offers plenty of appointment management power. If you often look up addresses and phone numbers as you schedule engagements, *DeskTop Set 3.0,* another *Windows* Best Buy, seamlessly integrates its calendar with an appointment book and a phone log.

Borland's *SideKick 2.0,* the Best Buy for DOS, ties with the *Windows* winners in ease of use. Like *DeskTop Set,* it has auto-dial and Rolodex capabilities, and it can reconcile schedules between your laptop and desktop machines. Another worthy DOS package, *Instant Recall,* delivers graceful appointment and project tracking features, but stumbles when you try to view your schedule.

Any busy person will benefit from using one of these four programs. They can't lighten your work load, but they'll help find time to get it all done.

Patrick Marshall is managing editor of the National Security Syndicate, a newspaper articles service, and an InfoWorld *contributing editor.*

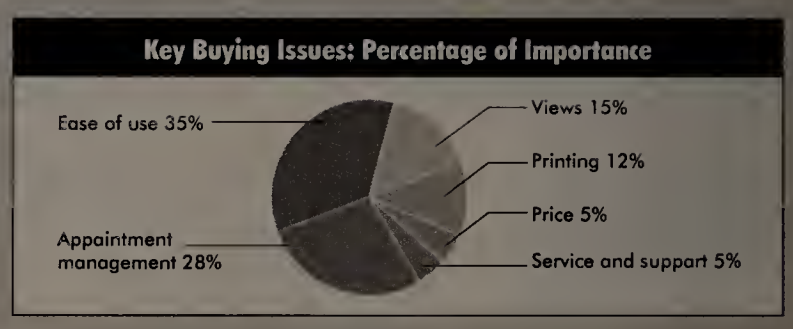
For more information about all products in this article, circle reader service no. 901.

EXECUTIVE SUMMARY

Well-Appointed Personal Schedulers

DeskTop Set, OnTime for Windows, and SideKick take the hassle out of time management.

Windows aficionados and DOS diehards both have something to appreciate in our scheduling Best Buys. **DeskTop Set** combines an elegant interface with strong scheduling and phone capabilities. **OnTime for Windows** sticks to calendaring and gets you up and running in minutes. Borland's trusty old **SideKick** is the DOS users' choice, thanks to its killer combination of low price and high ease of use.



Excellent ★★★★
Good ★★★
Foir ★★
Poor ★

	Reader service number	Ease of use	Appointment management	Views	Printing	Price	Service and support	Overall value
CA-UpToDate 2.66	673	☆☆	☆☆☆	☆☆☆☆	☆½	☆☆	☆½	★★½
DeskTop Set 3.0	674	★★★★	★★★½	★★★★	★★★★	★★★½	★★½	★★★★
Instant Recall 2.0	675	☆☆☆½	☆☆☆☆	☆☆☆½	☆☆☆½	☆☆☆½	☆☆☆	★★★½
OnTime for Windows 1.1	676	★★★★	★★★½	★★★★	★★★½	★★★½	★★★½	★★★★
Primetime Personal 2.0	677	☆☆☆	☆☆☆½	☆☆☆	☆☆½	☆☆☆	☆☆½	★★★
SideKick 2.0	678	★★★★	★★★½	★★★★	★★★½	★★★★	★★★½	★★★★
YourWay 2.0	679	☆☆☆	☆☆☆	☆☆☆	☆☆☆	☆☆½	☆☆☆	★★★

Overall value is calculated by multiplying each category rating by its weight percentage, summing the results, and rounding to the nearest half number.

Buying Smart: Timely Buys in Personal Schedulers

If an electronic scheduler doesn't make managing your hectic life a little easier, you've wasted your money. A scheduler should be as easy to use as its paper-based equivalent, but have numerous features for creating, viewing, and printing schedules. Unless you need a heavy-duty contact manager or network scheduler, it shouldn't cost much more than a good Day-Timer, either.

EASE OF USE

As with any software that claims to be personal, ease of use is essential. The key is how smoothly a scheduler integrates its daily planner, calendar, time lines, to-do list, and other components. Take a close look at how easily a package lets you change appointments and navigate with a mouse. Users of DOS-based schedulers will want a RAM-resident option with a small memory kernel, so they can pop up their schedules from inside RAM-hungry applications. *DeskTop Set*, *OnTime for Windows*, and *SideKick* all make scheduling a breeze.

APPOINTMENT MANAGEMENT

There's more to managing appointments than meets the eye. All schedulers let you fill in a daily planner with names and times, attach notes, create to-do lists, prioritize appointments, and set up recurring events such as a monthly managers' meeting. But the better ones offer conditional scheduling (letting you set appointments for, say, the third Thursday of each month) and enable you to overlap events (for example, to schedule a conference call in the middle of a meeting). And while most programs check your schedule for conflicts, only three check *all* occurrences of recurring events.

All these programs let you set alarms that pop up on screen minutes before a meeting, and most notify you when you boot up if you missed an alarm while the PC was turned off. And group scheduling features can really pay off for networked users. Wouldn't you rather compare calendars over the network than track endless loops of E-mail?

Finally, if your meetings often take place over the phone, you'll want phone accessories like an address book, a log for keeping track of calls, and an auto-dialer that lets you keep your hands where they belong—on the keyboard. A text editor is handy for jotting down notes as you gab. Overall, *Instant Recall* provides the most complete appointment management tools.

VIEWS

One big advantage of electronic schedulers is the variety of ways you can view your calendar. All schedulers offer a daily view, but the best display appointments a week or month at a time, making it far easier to reschedule meetings and plan trips.

Look for programs that offer daily and weekly time lines, which consist of bar graphs that show you chunks of free time at a glance. The capability to search appointments can also come in handy—you don't want to scan each day's schedule just to find out when "lunch with Bob" was supposed to happen. You'll also want to be able to search your notes (if, say, you remember Bob's company but not his last name) and search for specific amounts of free time. *OnTime for Windows* and *SideKick* provide especially complete and well-implemented viewing options.

PRINTING

Unless you plan to spend all your time in front of a computer, you'll want to take your schedule with you when you go. Any program worth a dime will print your daily schedule and your notes. Look for one that gives you weekly and monthly printouts as well—they're generally easier to take on the road or post in the office while you're away. If you plan to make your schedule public, you'll want a package that gives you control over font selection. And if you already carry a paper scheduler such as a Day-Timer or a Franklin Organizer, look for a package that can emulate those formats. *DeskTop Set* has the best set of printing capabilities, including mail merge.

PRICE

Most of the programs in this roundup cost around $100 or less on the street—and many offer more than simple scheduling for the money. In addition to scheduling panache, we factored in features such as group schedulers, phone accessories, and other extras to figure out which package gives you the best deal for your greenbacks. With built-in communications, phone management, calculator, text editor, and more, the venerable *SideKick* stands out as an amazing $99.95 value.

SERVICE AND SUPPORT

When you find yourself stuck, there's no substitute for prompt, efficient, and accurate technical support. We called each vendor several times, noting how long it took to reach a support technician and the quality of the answers. We also factored in support hours, toll-free numbers, and the availability of BBS and fax support. Campbell Services' support for *OnTime for Windows* and Borland's support for *SideKick* were especially impressive.

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4 MB RAM, 120 MB Hard Drive, Dual Floppy Drives (3.5" and 5.25"), Ultra VGA 1024NI Monitor (14", 1024 x 768, .28mm), MS-DOS 5.0/Microsoft Windows 3.1/Mouse

$2,299 Lease: $85/MO.

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$1,499 Lease: $55/MO.

Dimension NL20 i386SL 20 MHz System
2 MB RAM, 40 MB Hard Drive, Weight: 6.3 lbs. including battery, Minimum battery life: 2.5 hours, Edgelit VGA LCD (8.5" Diagonal, 640 x 480), MS-DOS 5.0/Microsoft Windows 3.1/Mouse

$1,799 Lease: $67/MO.

Dimension NL25 i386SL 25 MHz System
2 MB RAM, 60 MB Hard Drive, Weight: 6.3 lbs. including battery, Minimum battery life: 2.5 hours, Edgelit VGA LCD (9.5" Diagonal, 640 x 480), MS-DOS 5.0/Microsoft Windows 3.1/Mouse

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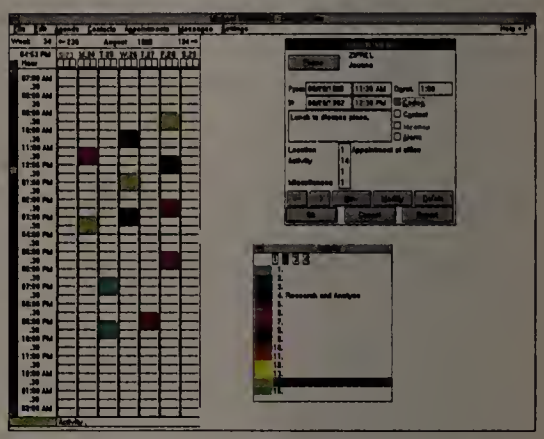
CA-UpToDate 2.66

PROS: Low-cost group scheduling, multiple appointment time lines **CONS:** Awkward, limited printing

WINDOWS *CA-UpToDate* takes a colorful approach to personal scheduling, but its awkward interface may leave you cold. To specify attributes like time and location, you must first create up to four categories—such as "meetings" and "conferences"—each of which can contain up to 15 color-coded entries. Sound confusing? It is.

Instead of building on a daily planner, *Windows*-based *UpToDate* centers on a weekly time line, where you double-click to bring up the day's schedule. You create appointments by filling out a contact form with name, title, address, and phone number of the person you're meeting—much as contact managers force you to do, but without their payoff of full-fledged contact tracking.

UpToDate displays a rich variety of views, but it's awkward to use and has limited print options. While you can print lists of appointments for any range of days, you can't print easy-to-read weekly or monthly views. The only standout feature is group scheduling at no extra cost. You can create groups of up to 255 users, and a time line shows which blocks of time are open for all members and which are open for all but a specified number. The $149 program is an affordable group scheduler, but most users want to get personal with it.



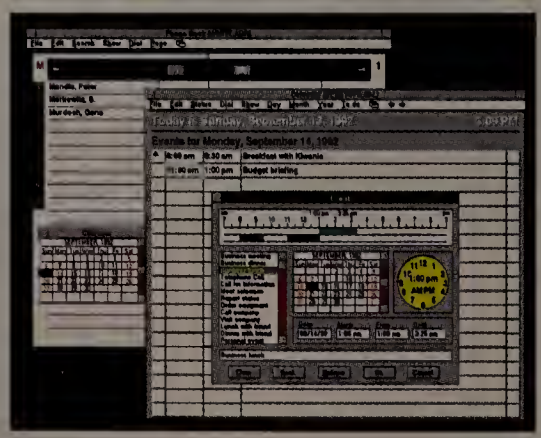
CA-UpToDate provides effective views of open time, but its complex color-coding scheme will try your memory.

DeskTop Set 3.0

PROS: Excellent interface, rich scheduling options, phone log **CONS:** No conflict checking, no weekly views

WINDOWS *DeskTop Set*, winner of our Best Buy in February 1991, rates that honor again. This *Windows* scheduler is so deceptively simple, it takes a while to realize just how powerful it is.

DeskTop's daily planner looks like a blank sheet of notebook paper. You fill in times and names, then set alarms and priorities. Dialog boxes give you access to almost every personal scheduling feature you'd want, including the capability to set up recurring appointments for, say, the first and third Thursday of each month. A tightly integrated address book and auto-dialer make it ideal for users who are glued to the phone.



DeskTop Set makes good use of your mouse—to pick appointment times, just click on a miniature clock dial.

But *DeskTop*'s real appeal lies in clever features like its month-at-a-glance view. You move cross hairs across color-coded time blocks until you find the one you want, then click the mouse, and up pops a box with the appointment's details. A unique phonetic search capability lets you snag appointments even when you can't remember how to spell someone's name.

DeskTop's not perfect. It can't check recurring appointments for conflicts, and it doesn't display a weekly time line. Still, for $149 you won't find a more personable *Windows* scheduler.

Instant Recall 2.0

PROS: Strong scheduling features, task manager, phone accessories, low price **CONS:** Limited graphical views and font selections

Instant Recall's clean design, strong search tools, and low price have long made it a popular DOS personal information manager. The $129 version 2.0 brings a host of improvements, including a phone log, beefier print capabilities, and a group scheduling option.

The program's scheduling capabilities are tops. You can create conditional recurring events, set alarms, and attach notes. A 22K memory-resident option gives you instant access to your schedule from any application.

However, with almost no graphical views, *Instant Recall* lacks other programs' capabilities to help you visualize your schedule. Its only time line is a weekly pop-up that shows blocks of open time. You can't view a detailed daily time line or peruse appointments by the week or the month. But version 2.0's printing features are strong, marred only by limited font selection.

Instant Recall's strong to-do list function, along with text-search and project-tracking tools, is a reminder that it's more than a scheduler. It's a good choice for DOS diehards who need a personal information manager and a calendar. But its many features make it slightly more complex than *SideKick*, leaving it just short of a Best Buy.

Instant Recall's clean interface makes moving between your daily schedule and to-do list easy.

High-Priority Schedulers: DeskTop Set, OnTime, and SideKick

DeskTop Set, OnTime for Windows, and SideKick pack plenty of power into deceptively simple interfaces.

● Yes
○ No
◒ Deficient
n/a = not applicable

	CA-UpToDate 2.66	DeskTop Set 3.0	Instant Recall 2.0	OnTime for Windows 1.1	Primetime Personal 2.0	SideKick 2.0	YourWay 2.0
Standard features							
Price	$149	$149[1]	$129[2]	$129	$189.95	$99.95[3]	$199[1]
Mouse support	●	●	●	●	○	●	●
RAM required	2MB	1MB	512K	1MB	180K	512K	1MB
Disk space required	600K	1.2MB	1.1MB	1MB	640K	3MB	2MB
RAM-resident kernel	n/a	n/a	22K	n/a	7K	40K	n/a
Appointment management							
Schedules recurring events	●	●	●	●	●	●	●
Conditional scheduling	○	●	●	●	●	◒	●
Conflict checking	●	◒	●	●	●	●	●
Conflict checks recurring appointments	●	◒	●	●	○	◒	●
Allows overlapping appointments	○	●	●	●	●	●	○
Sets alarms	●	●	●	●	●	●	●
Notify passed alarms at boot-up	●	●	●	●	●	●	○
Searchable note fields	○	◒	●	◒	●	●	●
Auto-dialer	●	●	●	◒	●	●	●
Phone log	○	●	●	◒	○	◒	●
Address book	●	●	●	◒	●	●	●
Text editor	●	●	●	◒	●	●	○
Group scheduling	●	◒	●[4]	●[4]	●[4]	◒	○
Views							
Daily view	●	●	●	●	●	●	●
Weekly view	●	●	◒[5]	●	○	●	●
Monthly view	◒[6]	●	○	●	○	◒[7]	●
Daily/weekly time line	●/●	●/◒	◒[8]/●	●/●	○/●	●/●	○/○
Searches for appointments	●	●	●	●	●	●	○
Searches for free time	●	◒	●	◒	○	●	○
Printing							
Weekly view	◒[9]	●	●	●	○	●	●
Weekly time line	○	◒	○	◒	●	◒	○
Monthly view	◒[9]	●	◒[9]	●	○	●	●
Font control	○	●	○	●[10]	○	◒	○[11]
Prints in organizer sizes	○	●	●	◒	○	●[12]	●[13]
Service and support							
Unlimited free support	●[14]	●	●	●	●	●	●
Toll-free number	◒[15]	◒	○	◒	○	◒	○
Weekday tech support (hours)	24	8	9	11	8.5	11	12
BBS/fax support	○/●	●/●	○/●	●/●	○/●	●/●	○/●
		BEST BUY		BEST BUY		BEST BUY	

[1] Includes mail-merge capability.
[2] Includes project tracking.
[3] Includes calculator, communications, and notepad with spelling checker and thesaurus.
[4] With extra-cost network version.
[5] Displays simple list, not day-by-day breakdown.
[6] Shows time blocks but no appointment details.
[7] Six-month view only; does not show appointment details.
[8] Same level of detail as weekly time line.
[9] Prints appointment list for specified date range.
[10] Limited to small, medium, or large formats.
[11] For to-do list only.
[12] One generic Day-Timer format.
[13] Four Day-Timer, four Franklin Desktop, and two YourWay formats.
[14] First 90 days only.
[15] Extra-cost option.

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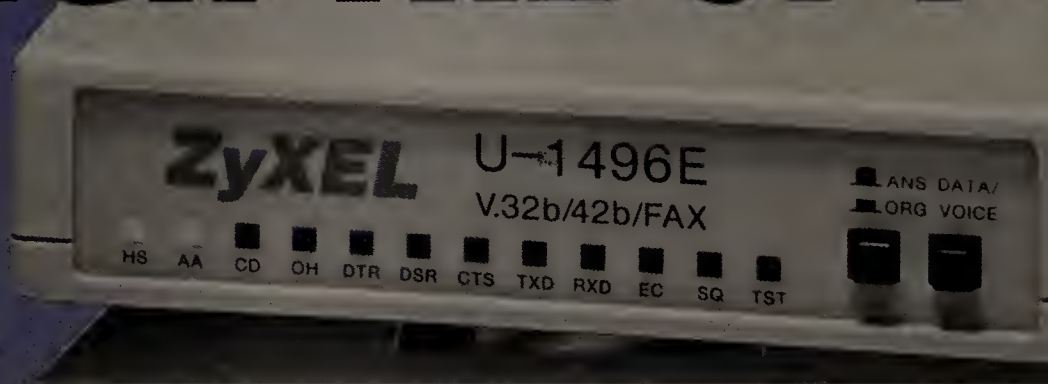

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Microcom QX/4232bis	$899	YES	YES	NO	NO	NO	NO
Hayes Ultra 14.4	$999	YES	NO	NO	NO	NO	NO
U.S. Robotics Courier V.32bis	$995	YES	YES	NO	NO	NO	NO
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ZyXEL U-1496E	$469	YES	YES	YES	YES	YES	YES

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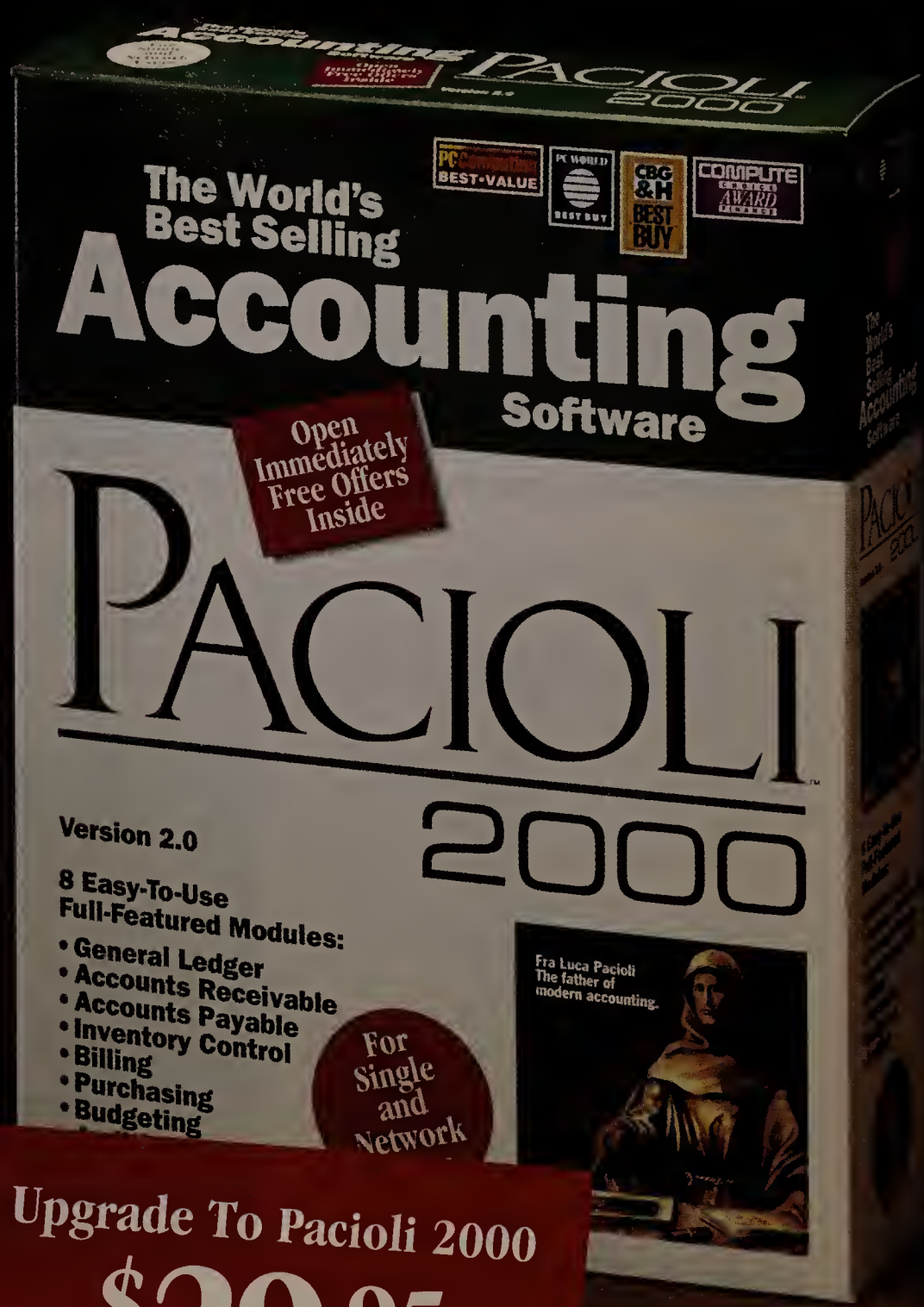

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OnTime for Windows 1.1

PROS: Flexible scheduling, intuitive interface, network option **CONS:** Lacks phone accessories, limited print options

WINDOWS *OnTime* does one thing—*Windows* scheduling—and does it very well. Its beautifully designed screens make setting appointments almost fun.

You'll have a hard time finding a *Windows* scheduler that's easier to use. *OnTime*'s main screen is dominated by the day planner, with appointments displayed in adjustable time increments. To view your schedule down the road, simply click on a date from one of three small monthly calendars.

OnTime has just about every calendar feature you can think of, from conflict checking to scheduling of biweekly meetings. A network version offers powerful group scheduling tools and notifies users when appointments are added to their calendars.

On the downside, *OnTime*'s reports are attractive but not very customizable, and you can't print schedules to slip into your Day-Timer. It also lacks *DeskTop Set*'s address book, log, and auto-dialer—features that will be missed by those who spend a lot of time in Ma Bell's meeting room. But if you don't need to tie your calendar to addresses and phone calls, you can't go wrong with this $129 Best Buy.

OnTime for Windows' simple, uncluttered screen makes it the friendliest scheduler around.

Scheduling and a Lot More

Some of the best schedulers aren't really scheduling packages per se. Here's a quick look at seven programs whose primary job is to manage contacts, projects, or local communications, but also offer powerful personal scheduling.

Act 2.1

Act is clearly designed for the sales pro who spends most of the day on the phone. In addition to an auto-dialer and phone log, the $395 *Act* offers lookup tables for fast scheduling of follow-up calls. The program won't let you set up recurring events or prioritize your to-do list, but its solid mail-merge features make it easy to zip out letters to clients.

Action Plus 5.0

Like *Act, Action Plus* is a contact manager with strong telephone and mail-merge capabilities. But this $495 package offers better personal scheduling than *Act,* with flexible alarms, the capability to handle recurring appointments, and more views of your schedule. A $1495 network version features sophisticated group scheduling and E-mail utilities.

Ascend 3.14

WINDOWS *Ascend* is the Dale Carnegie of contact managers. This $299 *Windows* program has all the basics for personal scheduling, plus about a half-dozen notepads and task lists for organizing to-do lists and projects. And when you find yourself veering from the straight and narrow, a Values and Goals utility helps you keep tabs on your "governing values," such as temperance and sincerity!

PackRat 4.0

WINDOWS While primarily a personal information manager (PIM), *PackRat* may be the most powerful all-around scheduler for *Windows.* This package provides utilities for tracking projects, resources, notes, and just about everything else. Though its profusion of PIM features makes it a tad tough for novices, the scheduler itself is fairly easy. Only its $395 price tag kept it from contending for a Best Buy. A $695 network version offers strong group scheduling features.

PC Tools 7.1

Is there anything this program can't do? Besides its many other virtues—

Primetime Personal 2.0

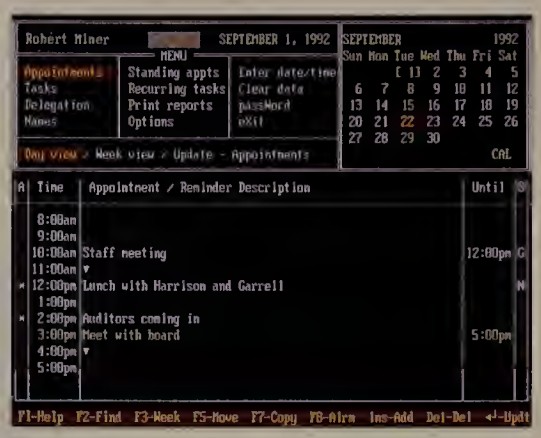
PROS: Full set of appointment tools, low-cost group scheduling, low TSR RAM requirements
CONS: No monthly or weekly views, limited conflict checking, minimal printing

Primetime Personal is easy to learn and doesn't skimp on scheduling features, but its lack of mouse support and limited views keep it from the limelight.

Primetime's logical setup and well-organized screens make it easy to get up and running. And the program offers every scheduling feature save one: It can't check all of your recurring appointments for conflicts.

However, once you get started, *Primetime* proves a tad more difficult. The character-based interface lacks color coding and sophisticated formatting options, which makes it harder to view your schedule at a glance or note high-priority items. Want to take your calendar with you? *Primetime* prints only your daily schedule and a weekly time line.

On the positive side, *Primetime*'s network version costs only $495 for a five-user license, and group scheduling is a snap to use. Simply go to 'Make Meeting', select the names of the people you want to include, and the program displays a weekly time line showing slots available to all participants. But with its limited views and minimal printing capabilities, the $189.95 *Primetime* is not yet ready to play.



Primetime gives you all the scheduling essentials, but its drab interface makes it harder to view your day at a glance.

data backup, disk repair and optimization, file management, and antivirus utilities—*PC Tools* also features a personal scheduler. And it's a pretty good one, offering alarms, limited recurring events, time-usage graphs, and more. You also get phone accessories like an auto-dialer and an address book, though no phone log. If you're looking to stretch your software dollar, the $149 *PC Tools* is hard to resist.

Who-What-When

Who-What-When's specialty is project and people management. The program makes it easy to track who's been assigned to what tasks and to follow the progress of projects. Like *PackRat*, this strong $295 scheduler is too expensive for personal scheduling alone. Those who need a group scheduler, however, would be well advised to check out this package's network version.

WordPerfect Office 3.1

At $149 per user, *WordPerfect Office* is a fairly cheap group scheduler, but it's not very personal. Designed for use on an office network, the no-nonsense, character-based program lacks colorful time lines and the customizable features of many other schedulers. But its scheduling options are rich, and it combines a highly capable group scheduler with full-fledged E-mail.

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LIST PRICE: $495/$1495
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Ascend 3.14
NewQuest Technologies Inc.
2550 S. Decker Lake Blvd.
Salt Lake City, UT 84119
800/877-1814
LIST PRICE: $249, with hard-copy day planner $299
Reader service no. 682

PackRat 4.0
Poloris Software
1820 S. Escondido Blvd. #102
Escondido, CA 92025
619/674-6500
LIST PRICE: $395, 3 users $695
Reader service no. 683

PC Tools 7.1
Central Point Software
15220 N.W. Greenbrier Pkwy.
Beaverton, OR 97006
800/445-4208
LIST PRICE: $149
Reader service no. 684

Who-What-When
Chronos Software Inc.
555 De Haro St. #240
San Francisco, CA 94107
415/626-4244
LIST PRICE: $295, server plus 6 stations $695
Reader service no. 685

WordPerfect Office 3.1
WordPerfect Corp.
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Circle 22 on reader service card

SideKick 2.0

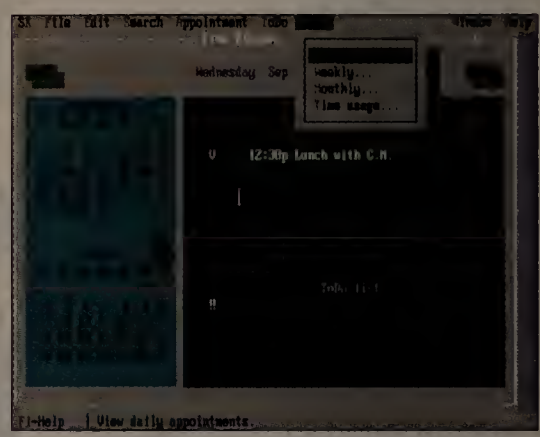
PROS: Low cost, easy to use, multiple views, extra accessories **CONS:** No conflict checking for recurring appointments

SideKick was one of the first electronic schedulers for DOS, and version 2.0 is still one of the best. For simplicity and power you won't do better than this $99.95 Best Buy.

Borland packs a ton of robust features into an interface that's so simple, even novices will feel right at home. Slick pulldown menus and intuitive dialog boxes make moving between *SideKick 2.0*'s time planner, address book, and notepad as easy as pressing a key.

SideKick 2.0 has almost all the scheduling moxie you can handle, though it can't check recurring appointments for conflicts or display a monthly calendar. The program more than compensates with a passel of features for users on the go. In addition to scheduling, you get a calculator, a Rolodex-style address book, and a communications program, all in a RAM-resident package of only 40K when it's not active—a big plus for notebook toters.

Even better, *SideKick*'s reconciliation feature lets you download your laptop's calendar to a floppy, view it alongside the schedule on your desktop PC, and copy or delete items so that both schedules match. For a trusty scheduling companion in the DOS environment, look no further than *SideKick*.



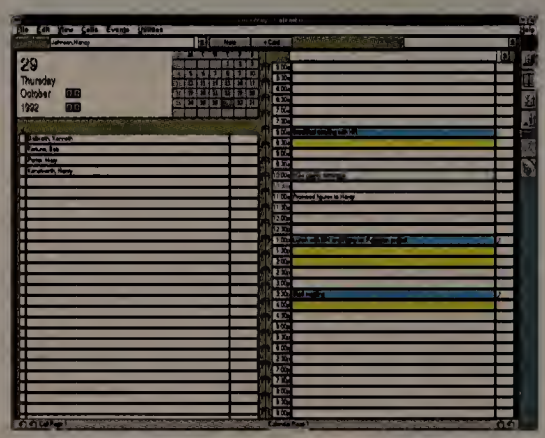
SideKick's simple but effective interface lets you view appointments and tasks in a variety of ways.

YourWay 2.0

PROS: Full scheduling features, attractive interface **CONS:** Can't search appointments, to-do list not integrated with calendar

WINDOWS *YourWay* is yet another impressive *Windows* scheduler, hiding strong scheduling features and phone accessories behind a pleasingly simple interface.

Setting appointments is a snap: Simply enter them into the day planner, and drag the mouse downward to block off as many time slots as you want. Since appointments are entered directly into time blocks, conflict checking is not a problem. In addition to a daily schedule, weekly and monthly views help give you the big picture. However, you can't set overlapping appointments or hunt down the nearest block of free time.



YourWay's interface is smooth—color-shaded appointments make it easy to locate blocks of free time.

And *YourWay*'s printing is bare bones—daily and weekly schedules only.

YourWay's one edge over *DeskTop Set* and *OnTime* is support for *Windows*' Dynamic Data Exchange. This lets you summon *YourWay*'s address book from, say, *Word for Windows* for easy insertion of names and addresses.

But while *YourWay* possesses unexpected strengths, it also has some annoying weaknesses—such as an incapability to search for appointments or display your to-do list and daily schedule on the same screen. With a relatively high price of $199 and minimal search facilities, *YourWay* is merely a good value, not a great one.

WHERE TO BUY

CA-UpToDate 2.66
Computer Associates
711 Stewart Ave.
Garden City, NY 11530
516/227-3300
LIST PRICE: $149
Reader service no. 673

DeskTop Set 3.0
Okna Corp.
P.O. Box 522
Lyndhurst, NJ 07071
201/460-0677
LIST PRICE: $149
Reader service no. 674

Instant Recall 2.0
Chronologic Corp.
5151 N. Oracle #210
Tucson, AZ 85704
602/293-3100
LIST PRICE: $99.95
Reader service no. 675

OnTime for Windows 1.1
Campbell Services Inc.
21700 Northwestern Hwy. #1070
Southfield, MI 48075
313/559-5955
LIST PRICE: $129, 3 users $356, 10 users $828
Reader service no. 676

Primetime Personal 2.0
Primetime Software Inc.
P.O. Box 27967
Santa Ana, CA 92799-7967
800/777-8860
LIST PRICE: $189.95, 5 users $495, unlimited users $1495
Reader service no. 677

SideKick 2.0
Borland Int'l
1800 Green Hills Rd.
Scotts Valley, CA 95067-0001
408/438-5300
LIST PRICE: $99.95
Reader service no. 678

YourWay 2.1
Prisma Software Corp.
2301 Clay St.
Cedar Falls, IA 50613
319/266-7141
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PC MAGAZINE EDITORS' CHOICE
March 17, 1992
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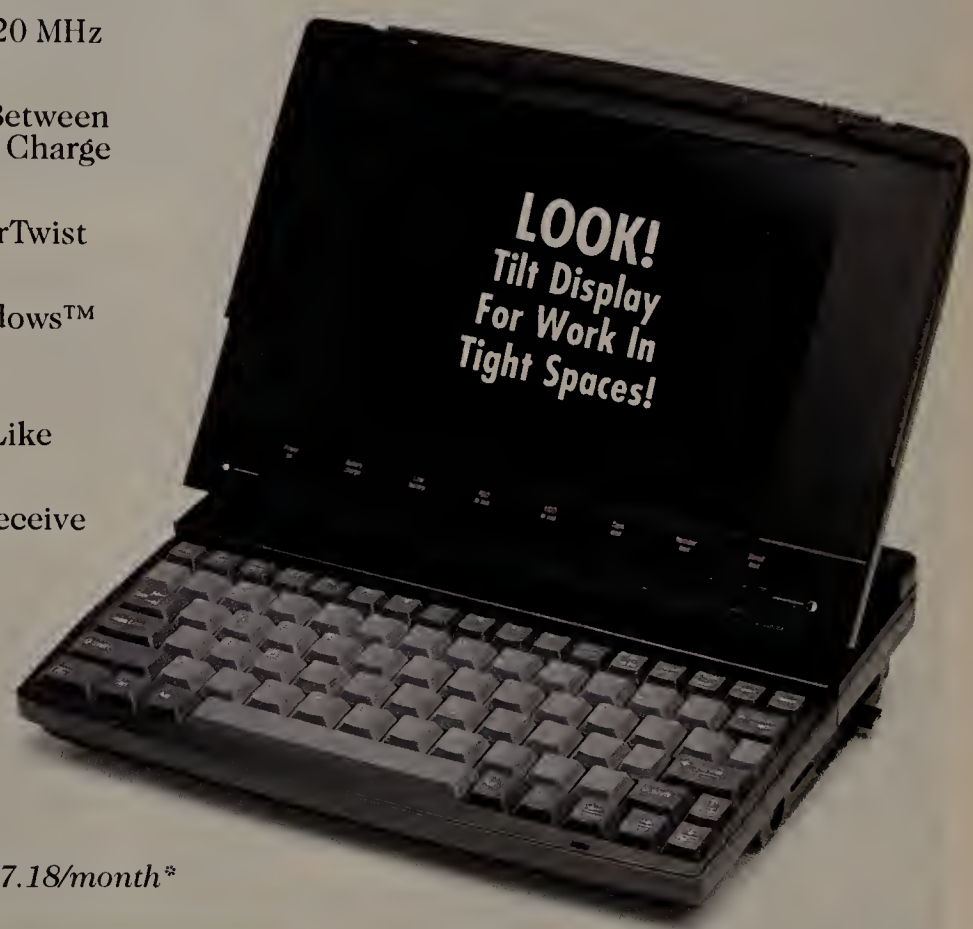

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— PC Magazine, May 26, 1992

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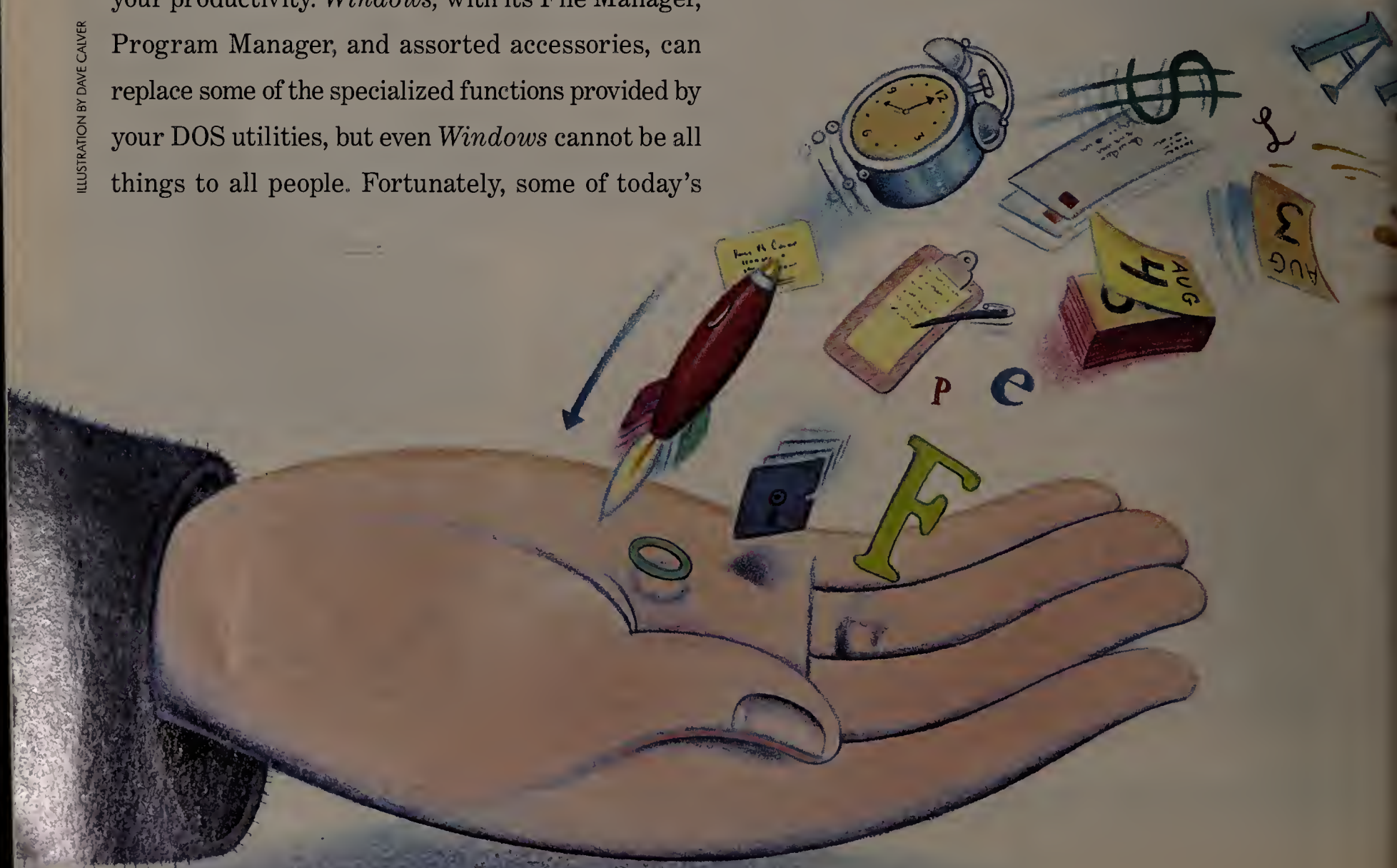
WINDOWS

Want super searching, a custom cursor, or even a fully functional communications program for less than $50? Try one of these 30 shareware impulse buys. **BY STEVE BASS**

If you've migrated to *Windows,* there's a good chance that you were pushed there—kicking and screaming, maybe — because you urgently needed some indispensable *Windows* application. In the exchange, you may have left behind a valued collection of DOS utilities, little programs with large effects on your productivity. *Windows,* with its File Manager, Program Manager, and assorted accessories, can replace some of the specialized functions provided by your DOS utilities, but even *Windows* cannot be all things to all people. Fortunately, some of today's brightest and most innovative software developers are writing imaginative programs to fill in the holes.

PC World surveyed user groups and monitored BBS's across the country to find 30 of the best *Windows* shareware utilities. Why shareware? Because it's low-cost, try-before-you-buy software. All the utilities

ILLUSTRATION BY DAVE CALVER

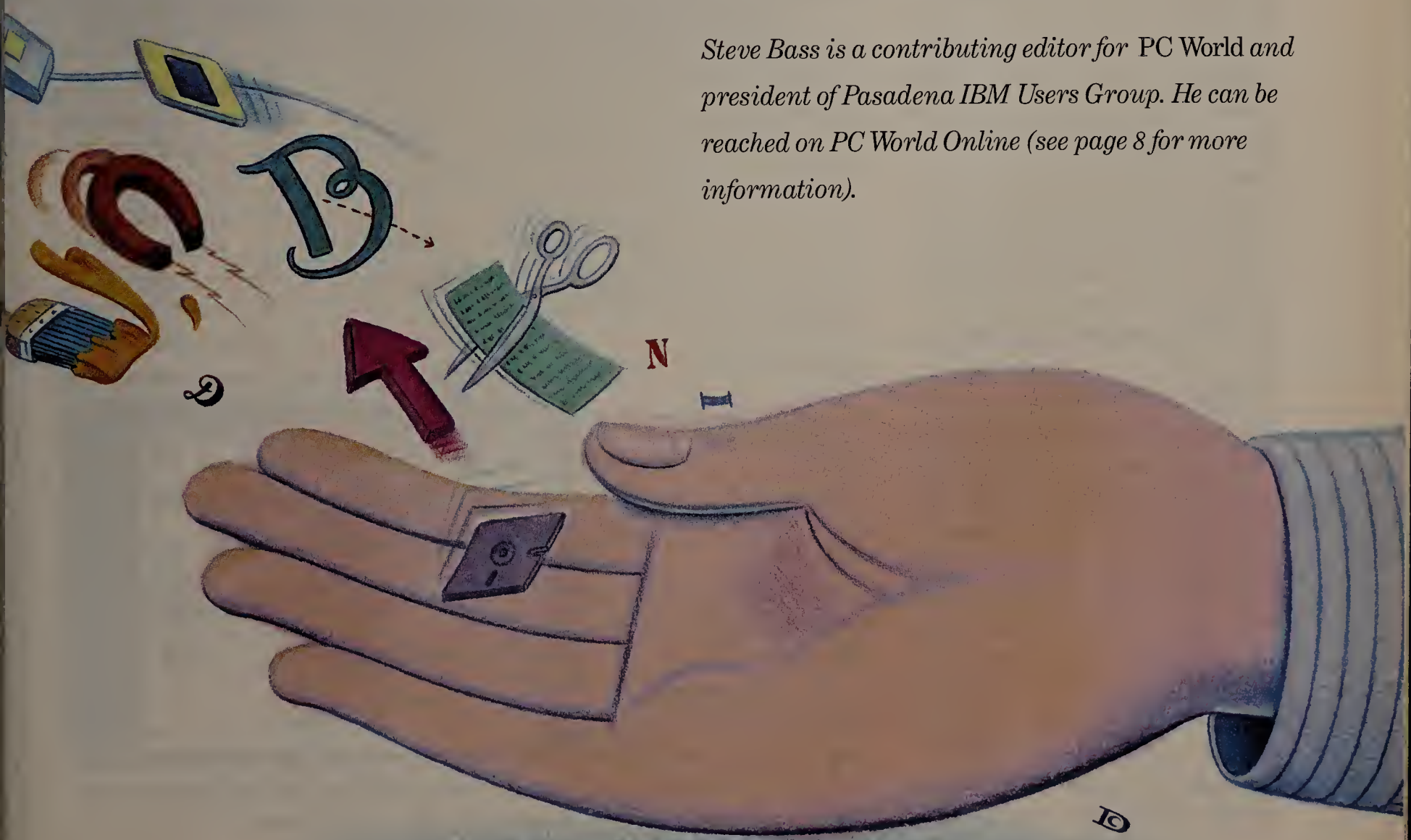


SHAREWARE

presented here are compatible with both *Windows 3.0* and *3.1,* but you won't really know if one's compatible with your particular application (or needs, for that matter) until you use it. Most of them, like *Hunter* and *WinGrab,* can save you time and increase your productivity. Some, like *Carets & Cursors,* just make your life in *Windows* a little more attractive.

Shareware comes with an unconditional guarantee: Try it for a reasonable amount of time—usually about 30 days—and if you don't like it, just stop using it (see "Getting Shareware On Line"). If you decide it's valuable enough to occupy space on your hard disk, send your registration and payment to the author. This will usually get you a manual, updates, and sometimes phone or BBS support. If that's not motivation enough to register, the annoying "nag" or "guilt" screen variations will probably provide the extra incentive. Some programs force you to read the license screen; others pop up randomly to pester you to register. Worst of all, some programs stop loading altogether after a preset period of time. At the least, registering will clear the guilt screen and your conscience.

Steve Bass is a contributing editor for PC World *and president of Pasadena IBM Users Group. He can be reached on PC World Online (see page 8 for more information).*



Almanac for Windows lets you configure the calendar to include a wide array of holidays.

▶ALMANAC FOR WINDOWS 3.0

Almanac for Windows is a full-featured personal scheduler that includes a notepad, alarm clock, day calendar, and event viewer. What's more, *Almanac for Windows* offers sunrise and sunset information, phases of the moon, and dates of holidays. To keep track of appointments and day-to-day scheduled entries, double-click on any date in the main month display area to activate the Brief DayView. From there, it's easy to access notes for each day or scheduled entry or to set alarms for appointments, including recurring ones. *Almanac for Windows* supports portrait and landscape laser printing of monthly and yearly calendars, plus notes and daily schedules. Impact Software, 12140 Central Ave. #133, Chino, CA 91710; 714/590-8522, 714/590-0500 (BBS). List price: $49. Download: ALM30.ZIP.

▶CARETS & CURSORS 1.3

Want to add pizzazz to *Windows'* humdrum cursors? Download a copy of *Carets & Cursors* and take control of your arrows. This nifty program provides a way to assign a variety of mouse pointers and text editing cursors for all *Windows* applications. Configure the cursor to change its shape to a thumb, for example, whenever you press a button, or to turn into a thin, easy-to-point arrow when choosing a file in File Manager. Once you assign a cursor to a *Windows* class—say, all buttons or scroll bars—the changes occur systemwide. *Carets & Cursors* comes with over 27 mouse pointer designs, including swords, flashlights, pencils, and mice. It also works with any DOS application that supports a mouse. Instant Replay Corp., 4525 South 2300 East, Salt Lake City, UT 84117; 800/388-8086, 801/272-0671, 801/272-0675 (fax and BBS). List price: $24.95. Download: CCDEMO.ZIP.

▶CLIPMATE FOR WINDOWS 1.14

As the name suggests, *ClipMate for Windows* complements *Windows'* Clipboard rather than replacing it. Normally, when you cut or copy a text item to the *Windows* Clipboard, it's deleted for good the next time you copy or cut an item. You can think of *ClipMate for Windows* as a sort of "Clipboard rememberer." *ClipMate* captures the Clipboard data and writes it to a file. Clicking on *ClipMate's* Magnify feature takes you to an editing screen where you can scroll through the captured contents of past Clipboards and edit them as desired. You can save each *ClipMate* file in short- or long-term storage or chain multiple files together. Chris Thornton, P.O. Box 26263, Rochester, NY 14626. List price: $20. Download: CLIPMATE.ZIP.

Reader service no. 645

▶COMMAND POST CP-72C

If you're giving up DOS for *Windows* but still want DOS's batch files and a character-based flavor, try *Command Post*. With this program you can control the *Windows* environment with a powerful menu and multiple-window file manager. The menu not only lets you quickly open or switch to an application, but also gives you access to neat utilities such as the music player and wallpaper changer. *Command Post's* powerful batch language supplies the tools to create and customize menus. *Command Post* has a built-in screen blanker. Wilson WindowWare, 2701 California SW #212, Seattle, WA 98116; 800/762-8383, 206/935-7129 (fax). List price: $49.95. Download: CP-72C.ZIP.

Reader service no. 646

▶CT-SHELL 2.20

As a DOS shell, *CT-Shell* made it easy for novices to bypass the command line. Computer Training now has an equivalent that's perfect for beginning and advanced *Windows* users. *CT-Shell* acts as a replacement for *Windows'* File and Program Managers. For example, although the *Windows 3.1* File Manager is improved, *CT-Shell* is easier to use for tagging and copying, moving, and deleting files. Other features include an event scheduler with alarms, a phone data base with automatic dialer, and a file-finding utility. Computer Training, 13215 N.E. 123rd St. #114, Kirkland, WA 98034-8032; 206/820-6859. List price: $35. Download: CT220.ZIP.

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▶FONTER 4.1

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or *FaceLift*. You can cut and paste special characters into other programs, print a font list with samples, print character set charts showing all available characters for any font, or output a complete font book, showing every font and character available. *Fonter* also lets you zoom in for a close look at individual characters. OsoSoft, 1472 Sixth St., Los Osos, CA 93402; 805/528-3753 (BBS). List price: $15. Download: FONTER.ZIP.

Reader service no. 648

▶HUNTER 2.0

The more you use *Windows*, the quicker you fill your hard disk, until locating a particular file becomes an exasperating task. With *Hunter*, you get a magnet whose sole purpose is finding files or specific text within files. *Hunter* is easy to use: Choose one or more drives, and set the search criteria based on file name, date, or size. From the pulldown menu, use the Grep command—with over 12 pattern examples—for sophisticated text searches. Use (-212[ )\\/-]- -:d:d:d[-]:d:d:d:d, for example, to find every occurrence of a phone number with an area code of 212. If the file you find has an association in your WIN.INI, a double-click lands you in the application. International Windows User Group (WUGNET), P.O. Box 1967, Media, PA 19063; CompuServe: 76357,2064. List price: $30. Download: HUNTER.ZIP.

Reader service no. 649

▶ICON MANAGER 1.2

If you've collected more icons than you'll ever use, maybe you need *Icon Manager*, a convenient way to create, organize, extract, and modify them. You start by telling *Icon Manager* to create a new icon library window, named, for example, Graphics Icons. Then have *Icon Manager* search your hard disk for files ending in ICO or EXE, and select the icons you want to place in that library window. You can create as many libraries as you want and drag and drop icons to move or copy them into other libraries. It's easy to capture an image from another program and turn it into an icon. Impact Software, 12140 Central Ave. #133, Chino, CA 91710; 714/590-8522, 714/ 590-0500 (BBS). List price: $19.95. Download: ICONMGR.ZIP.

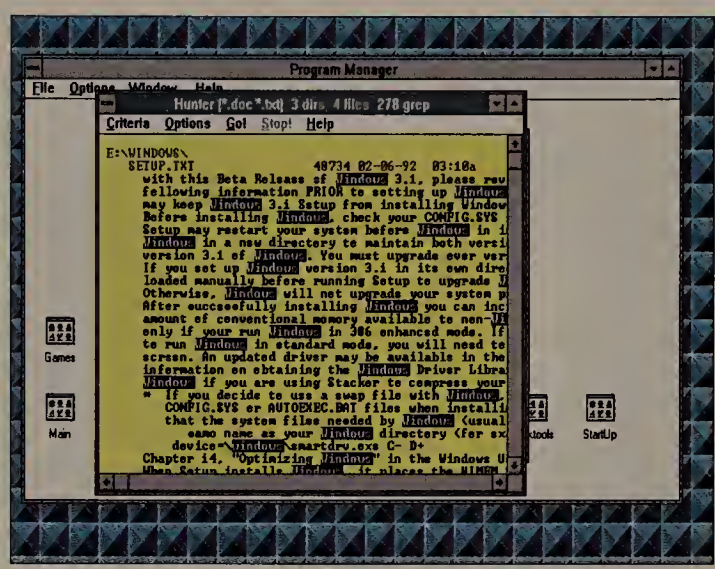
▶LAUNCH 2.22

Launch's rocket ship icon will transport you to a new way of using *Windows*—bypassing the clunky Program Manager. Once you've installed the program, you activate *Launch*'s pop-up menu by clicking a user-definable mouse button on any unoccupied portion of the desktop or by using the programmable keyboard hot key. You then highlight the application you want to run and *Launch* it. Customizing *Launch* is a snap. Among many other options, you can choose to make *Launch* the shell from which to run *Windows*, tell *Launch* to hide its icon, define new menu titles and multiple layers of submenus, and assign hot keys to run your favorite programs. Summit Research, Inc., 3321 Lauren Way, Lewisville, TX 75028; CompuServe: 76336,1436. List price: $39.95. Download: LAUNCH22.ZIP.

▶LI FOR WINDOWS 1.22

There are times when you need to find, view, and edit multiple files quickly, and *LI for Windows* is made for the job. From the Open File dialog box, you can search multiple disk drives for files matching specific texts or conditions. When it has found your file, *LI* lets you view or edit it in ASCII. You can also delete, print, cut and paste, and launch the file's associated program. A handy Tree view makes navigating through subdirectories a breeze. Third Millennium Technologies, P.O. Box 852382, Mesquite, TX 75185; CompuServe: 73537,1203. List price: $20. Download: LI122.ZIP.

Reader service no. 650



Get Hunter on the trail for fast text searches—here, it's finding every occurrence of the word "Windows."

▶MAGIC SCREENSAVER 1.40

Making sure an image doesn't burn into your screen when the computer's unattended is the main job of a screen saver. *Magic ScreenSaver* eats up only 84K of disk space and gives you an eye-pleasing color pattern of random geometric shapes you can change to suit your mood. The time-out mode is configurable from 1 to 999 minutes, or you can activate *Magic ScreenSaver* by moving your mouse pointer to a configurable sleep corner. If you choose, you can require a password to awaken your computer from sleep mode. Software Dynamics, 84 Coach Gate Way, Calgary, Alberta T3H-127 Canada; 403/240-0103, 403/240-0105 (fax). List price: $25. Download: MAGIC.ZIP.

Reader service no. 651

▶MICROLINK FOR WINDOWS 1.0

MicroLink for Windows is a full-featured, highly configurable modem communications application that works in the background. The dialing directory holds a data base of phone numbers along with the accompanying log-on scripts, terminal settings, and port settings for each selection. Among other features, *MicroLink*'s button bar lets you send or receive files, print captured text, open a log, and invoke a script. There are eight transfer protocols, including ZMODEM, and the function keys can be programmed as shortcut keys. Modem status—initialization,

With MicroLink you get an array of powerful communication features, such as the on-screen status bar.

auto-answer mode, receive, and send—is indicated on a light bar, especially handy for those with internal modems. *MicroLink* comes with comprehensive documentation. MicroWerks, P.O. Box 768273, Roswell, GA 30076. List price: $35. Download: MLINK.ZIP.

▶MONEY SMITH 1.2E

Money Smith is a flexible accounting system that comes with three account charts already set up for you—small business, home, and renter. The program lets you manage multiple accounts, print checks, create a budget, and keep track of investments, including stocks and mutual funds. The tool bar gives quick access to transactions, accounts, the check register, and investments. With *Money Smith* you can print a balance sheet, income statement, tax summary, and other reports. Assets, liabilities, income, and expense reports can be viewed as graphs. Money Smith Systems, P.O. Box 333, Converse, TX 78109. List price: $29.95. CompuServe: 71355,470. Download: SMITH12E.ZIP.

Reader service no. 652

▶PAINT SHOP PRO 1.01

If importing the proper image format into your favorite desktop publishing program is your problem, then *Paint Shop Pro* is your solution. This top-notch program supports more than 12 file formats, including BMP, PCX, PIC, TIFF, and GIF and even offers its own proprietary JAS file compression. *Paint Shop Pro* also is a versatile capture utility and image manipulation tool. You can capture a *Windows* screen, a single window, or a selected area of the screen. Then you can improve on the original, using *Paint Shop Pro*'s sophisticated imaging tools to trim, resize, and adjust color components. JASC, Inc., 17743 Evener Way, Eden Prairie, MN 55346; 612/934-7117. List price: $49. Download: PSP101.ZIP.

Reader service no. 653

▶PIXFOLIO 1.044

PixFolio lets you view and catalog most major graphics images, including TIFF, PCX, GIF, and RLE. With *PixFolio* you first select the images you want to include in a catalog. When you open the catalog, you can display the images as thumbnails or view them in their entirety. The program can read in one format and save in another for quick file conversions, and you can display images as a slide show. The edit feature lets you expand, resize, crop, cut and paste, or copy an image from the Clipboard. You can also print all or part of an image. ACK Software, 298 W. Audubon Dr., Shepherdsville, KY 40165; 502/543-3438. List price: $35. Download: PIXF1044.ZIP.

▶PRINTER'S APPRENTICE 4.02

Printer's Apprentice is an easy way to browse through your computer's type families, including scalable fonts that come with type management software such as *TrueType, ATM,* and *FaceLift.* When *Printer's Apprentice* first loads, it finds and lists the fonts on your hard disk. You can view any font in roman, bold, italic, or bold italic, change the size by sliding the point size bar, or see its extended character equivalent with the ANSI bar. *Printer's Apprentice* generates sample sheets for hard copy font catalogs. Lose Your Mind Software, 24 Winterset Ln., Simsbury, CT 06070; 203/658-4809. List price: $20. Download: PA402.ZIP.

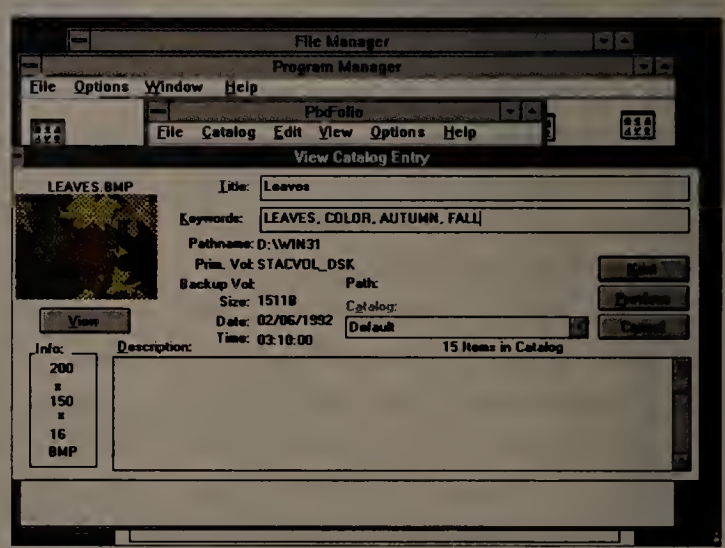
Reader service no. 654

▶THE PRINT QUE FOR WINDOWS 1.2

If you use *Excel* or *Word for Windows,* you'll probably want this speedy, hassle-free way to print files. Launch this application, and you'll see a dialog box from which you choose the directory of the files you want to print. Double-click on the appropriate files to add them to the queue, press the Start button, and *Print Que* opens either *Excel* or *Word for Windows,* sends the specified files to the printer, closes the application, and returns you to the desktop. ArGin Software, 133 Parker St., Lowell, MA 01851. List price: $25. Download: QUE12.ZIP.

▶ROCKFORD 2.0

Be who you want to be with *Rockford.* This elaborate business card program includes a graphics preview screen that shows your card just the way it'll print—and you can make as many changes as you'd like. The program offers many powerful formatting options, such as horizontal and vertical card designs; line, box, and circle draw-



Images won't clutter up your hard disk if you manage them with PixFolio.

ing; four border types; and automatic bulleted lists and clip-art support. *Rockford* prints camera-ready copy up to twice the original size. OsoSoft, 1472 Sixth St., Los Osos, CA 93402; 805/528-3753 (BBS). List price: $15. Download: ROCKFORD.ZIP.

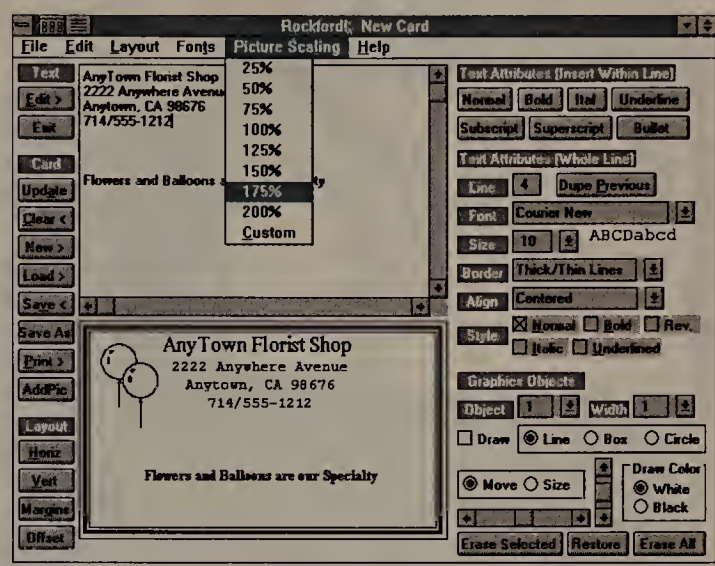
Reader service no. 655

▶ROUTE 1 2.0

When you install *Route 1*, it pops up vertically on the right side of your screen with preconfigured *Windows* accessory buttons at the ready: Notepad, Terminal, Paintbrush, and others. If you use other applications repeatedly, attach them to *Route 1* for instant access. You can organize applications by category because each button can be configured with submenus. For example, designate a button for *Windows'* control functions—SysEdit, Control Panel, and Setup. *Route 1* has dozens of unique icons and adequate help explaining how to access submenus and create a start-up script. David A. Karp, P.O. Box 20024, Oakland, CA 94620. List price: $14. Download: ROUTE1V2.ZIP.

▶SYSUSE 1.2

Have you ever received a message in *Windows* that says you have insufficient memory to run an application? Sometimes that means you don't have enough free *Windows* system resources, and sometimes it means you have *plenty* of memory but *Windows* can't use it because it's not contiguous. *SysUse 1.2* is a simple utility that keeps tabs of your system use in four key areas: CPU, memory, *Windows* system resources, and disk space. When *SysUse* indicates your system resources are almost gone, you'll know when it's time to close down a few windows. Better yet, *SysUse* solves the problem with noncontiguous memory: Choose the Options menu from the *SysUse* window or icon and click on Compact. *SysUse* calls the GlobalCompact *Windows* programming function to ensure free memory is contiguous. You can then start your application without the frustration of closing down other programs. Jonathan Reed, 1575 Agnes Ave. SE, Palm Bay, FL 32909; 407/725-5318. List price: $5.95. Download: SYSUSE12.ZIP.



Save a bundle by designing your own business cards with a little help from Rockford.

▶VIRUSCAN FOR WINDOWS 89

Like its famous DOS counterpart, McAfee's *Viruscan for Windows* scans your entire system for known computer viruses. The program detects and identifies viruses it recognizes and

Getting Shareware On Line

If you can do without fancy packaging and shrink wrap, you can sample all the shareware you want for the price of an electronic download.

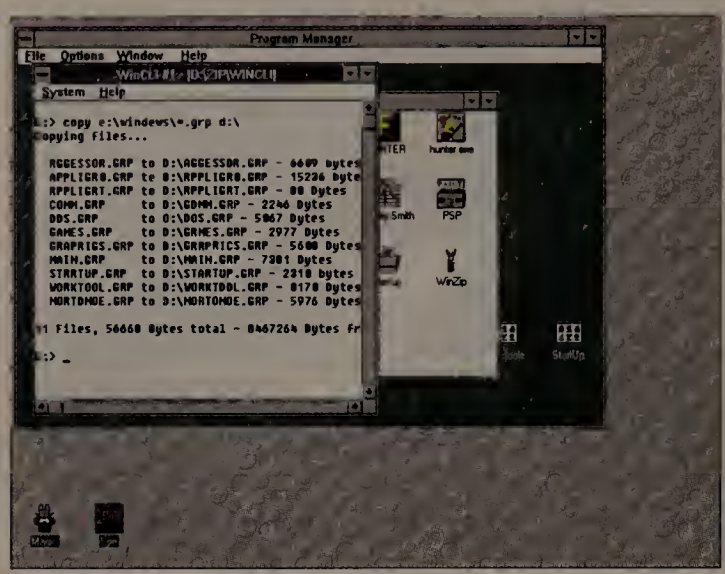
You can download any shareware program reviewed here from the utilities section of PC World Online's Software Library. We've also listed the more popular on-line services and BBS's across the country. To minimize your phone bill once you're on line with a service or BBS, download the ZIP file of all available software programs. You can then log off, unarchive the list, and examine the product descriptions at your leisure. If you don't already use *PKZIP*, you'll also need to download this popular and widely used shareware ($25) file compression program to open ZIP files.

If you don't have a modem, you can obtain a monthly catalog from most of the software distribution firms listed here, and some produce large sourcebooks. PC-SIG even offers its shareware collection on CD ROM.

User groups are a rich source of up-to-date shareware. Most clubs have a shareware librarian who gets the programs directly from the author. Access to the library ranges from distribution at monthly meetings to members-only BBS's.

Resist the temptation to get shareware from a friend. Not only might you get incomplete files, you risk picking up a virus. The best bet is to take your friends' recommendations but not their disks.

No matter where you get your shareware, even if it's directly from the author, it's always a good idea to scan the software for viruses. Although most virus detectors can't scan a ZIP file, there's an easy solution. Simply create a temporary subdirectory, unzip the files into it, and scan them. If the files pass muster, copy them to a permanent location.



Hard-core DOS users will feel secure with WinCLI in their Windows toolbox.

tells you if one has infected system memory, a boot sector, or a file. If it detects a virus, you run Clean-Up to disinfect the system and repair damaged areas. The package includes an automated installation program, full documentation, and *Viruscan* for DOS. McAfee Assoc. LP, 3350 Scott Blvd., Bldg. 14, Santa Clara, CA 95054; 408/988-3832, 408/988-4004 (BBS). List price: $35 home use, site license for businesses. Download: WSCAN89.ZIP.

Reader service no. 656

▶WINCLI 3.02

Get to the DOS prompt in *Windows* in a flash with *WinCLI*. This *Windows* command-line interface opens its own window to give you lightning access to the familiar C> prompt to run your favorite DOS and *Windows* apps. For example, instead of clicking on an icon to open *Excel* or *Write*, just type the name of the program. *WinCLI* searches your PATH command, locates the program EXE file, and opens the program in the appropriate operating environment. Eschalon Development Inc., 110-2 Renaissance Sq., New Westminster, BC V3M 6K3 Canada; 604/520-1543. List price: $35. Download: WINCLI.ZIP.

Reader service no. 657

▶WINCLOCK 3.20

Run *WinClock 3.20*, and you'll get an on-screen display of time and date along with plenty of alarms, beeps, and timers. *WinClock* gives you ten alarms you can choose to set daily, weekly, or periodically, each with an attached note. And *WinClock* will let you set a program to run at a specified time. David A. Feinleib, 1430 Massachusetts Ave. #306-42, Cambridge, MA 02138; 617/484-5304. List price: $16. Download: WINCLOCK.ZIP.

Reader service no. 658

▶WINDOCK 1.51

WinDock is a flexible and powerful substitute for *Windows'* Program Manager. When you first install *WinDock*, a "dock" button will appear in the right-hand corner of your screen. Then, using *Windows 3.1*'s drag-and-drop capabilities, you attach an application to *WinDock* by dragging the application over from File Manager and dropping it on the dock. Each docked application appears as a separate button under the *WinDock* icon. Then not only can you launch the application by double-clicking its button, you can even drop a file onto it and the program will come up with that file. Brian E. Capson, 8 Marlin Terr., St. John, New Brunswick E2K 2B6 Canada; 506/648-9299. List price: $15. Download: WINDCK15.ZIP.

▶WINEZ 3.0B

So you've got a dozen applications open and navigating through them is giving you a headache? Get organized with *WinEZ*, a simple way to switch quickly between applications or open new ones. *WinEZ* puts two icons on the title bar of your active application. Clicking on the first icon instantly gets you *WinEZ*'s Power Menu and a list of every group in Program Manager. Scrolling the list shows each application within each group for immediate access and loading. The second icon is a fast task switcher. The handy End Task feature immediately closes a *Windows* application. New Generation Software, P.O. Box 9700, Dept. 271, Austin, TX 78766-9700; 800/964-7638, 512/795-8300. List price: $29.95. Download: WINEZ.ZIP.

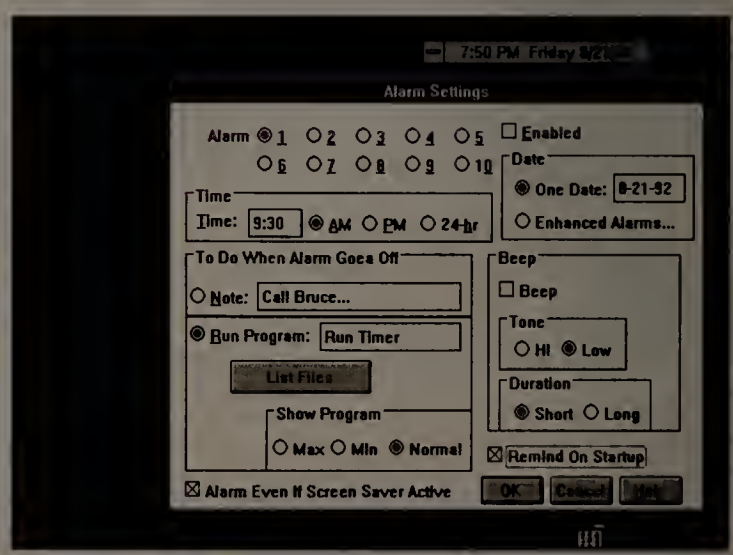
Reader service no. 659

▶WINFIN 1.0

Should you cash in your CD now? Pay off your installment loan? Instead of creating a spreadsheet, load up *WINFIN*, a collection of 11 handy financial programs. In each program, all you do is fill in an unknown value, click the Calculate button, and view the results. For example, to calculate the worth of a CD, enter the face value, fees, date of purchase, and maturity, and *WINFIN* will tell you the net cost and income, APR, and quoted rate. The package includes programs for analyzing mortgages, bonds, U.S. Treasury Bills, Bankers Acceptance, and other financial instruments. Gjetaas, Inc., 7251 Mt. Baker Hwy., Deming, WA 98244; 206/599-2418. List price: $20. Download: WFINANCE.ZIP.

▶WINGRAB 6.1

Wouldn't you love to capture an on-screen address and send it to the printer formatted for an envelope in less than two mouse clicks? *WinGrab* is an easy-to-use, intelligent envelope ad-



WinClock gives you an on-screen clock and nudges you into action with ten handy alarms.

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dresser that lets you do just that. *WinGrab* supports PostScript- and LaserJet-compatible printers and works with multiple printers simultaneously—for example, one port can print envelopes while another prints shipping labels. *WinGrab* is bundled with *WinGDB*, a data base that maintains files of names, addresses, and print labels for mass mailing projects. Included in the package are macros for attaching *WinGrab* and *WinGDB* to your *Windows* word processor. ZPAY Payroll Systems, Inc., 2526 69th Ave. S, St. Petersburg, FL 33712-5631; 800/468-4188, 813/866-8233. List price: $49.95. Download: GRAB61.ZIP.

Reader service no. 660

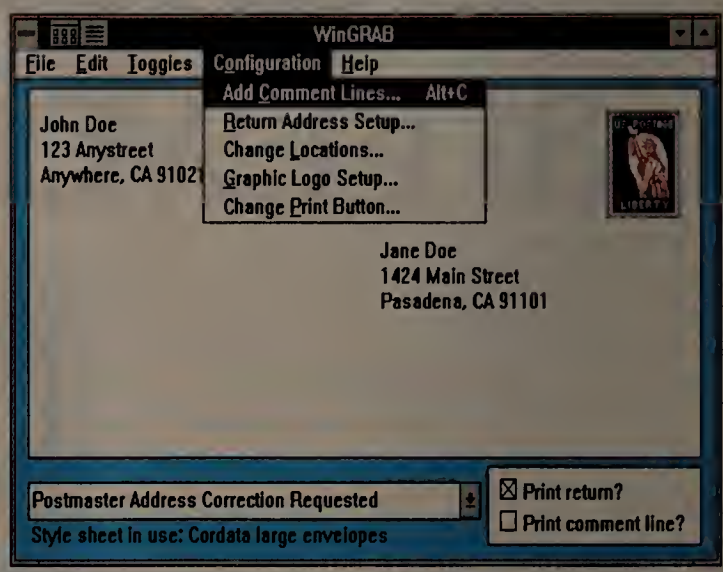
▶WINPOST 3.1A

Is your hard disk overflowing with calendar utilities—but you still miss appointments? Now there's *WinPost*, a handy program with electronic "little yellow stick 'ems." You can attach as many as 100 reminders on screen, hide them, and then set *WinPost* so they'll reappear and sound an alarm at the specified moment. You can edit each note and easily configure its size, color, and text font. A layout feature makes it simple to assign notes to various categories, so you'll see only those notes that relate to your specific application or task. Eastern Mountain Software, P.O. Box 20178, Columbus, OH 43220; 614/798-0910. List price: $30. Download: WINPOST.ZIP.

Reader service no. 661

▶WINPSX 2.0

PostScript printing in *Windows* can be a lengthy process. *WinPSX* reduces the time by downloading predetermined sets of PostScript fonts to the printer when you start *Windows*. *WinPSX* also lets you print a device information report for a list of available fonts in the printer and font samples. You can predefine a group of soft fonts to download for specific projects. This timesaving utility allows you to access any port or send the fonts to a file. Costas Kitsos, P.O. Box 64943, Los Angeles, CA 90064; 310/203-8108. List price: Free. Download: WINPSX20.ZIP.



WinGrab is a speedy alternative to the typewriter for addressing envelopes.

▶WINZIP 3.1

Most shareware is distributed as a ZIP, ARC, or LZH file—an archive containing one or many compressed files—and until now, you had to get back to DOS to decompress them. *WinZip* is a powerful yet intuitive *Windows* program for everyday archive management. The program handles the routine chores of viewing, running, extracting, adding, and deleting archived files, and it also scans for viruses. In addition, with *WinZip*'s automated Checkout feature, you can quickly examine the archived files. *WinZip* extracts all the files to a temporary subdirectory and creates a Checkout program group with one icon for each file. When you close *WinZip*, you can keep or delete the new program group. Nico Mak, P.O. Box 919, Bristol, CT 06011-0919; 800/242-4775, 713/524-6394; CompuServe: 70056,241. List price: $29. Download: WINZIP.ZIP.

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Vienna, VA 22182-2285
800/827-6364 ext. 6138

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617/354-3230 (BBS)

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Columbus, OH 43220
800/848-8199

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414/789-4200,
414/789-4210 (BBS)

Executive Network
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Mt. Vernon, NY 10550
914/667-4567 (BBS)

GEnie
General Electric Information Services Co.
401 N. Washington St.
Rockville, MD 20850
800/638-9636

HH Info-Net
220 Moin St. #5B
New Hortford, CT 06057
203/738-0342 (BBS)

Reasonable Solutions
1221 Disk Dr.
Medford, OR 97501
800/876-3475,
503/776-5777

Windows OnLine
Box 1514
Donville, CA 94526
510/736-8343 (BBS)

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Olney, MD 20832
301/924-3594,
301/963-2708

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Sunnyvale, CA 94086
800/245-6717,
408/730-9291

Public Brand Software (PBS)
P.O. Box 51315
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317/856-2086 (fox)

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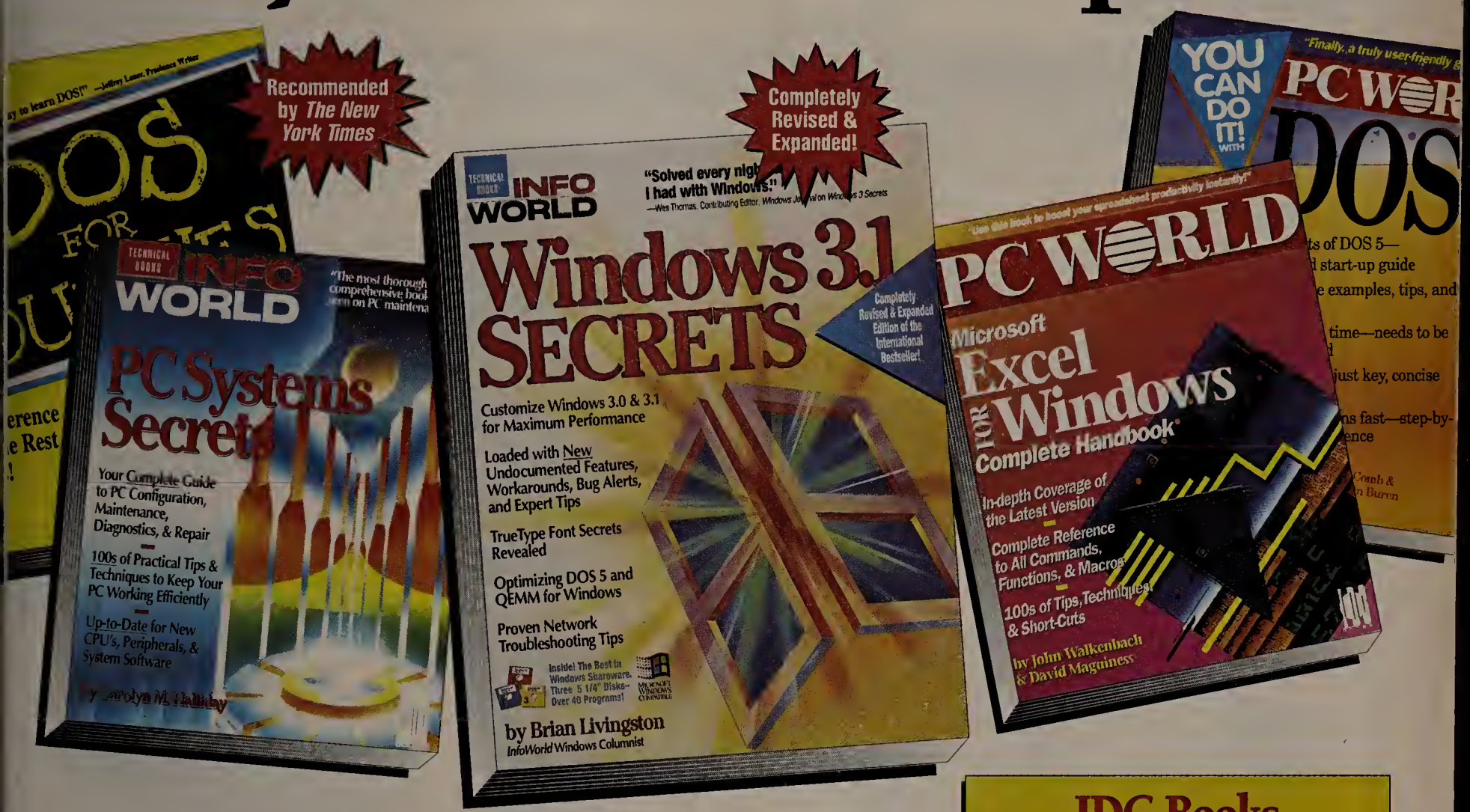

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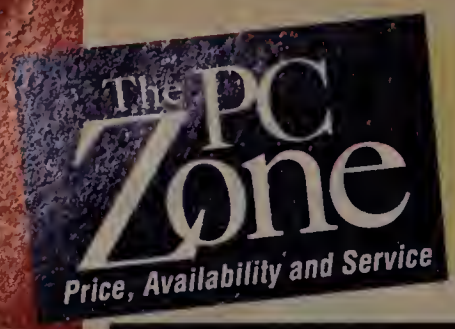

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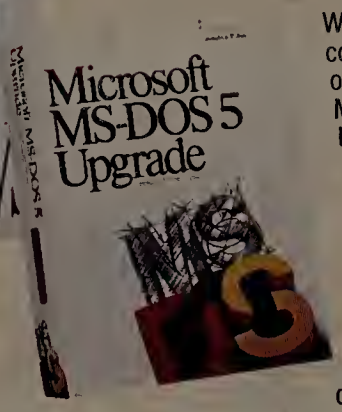

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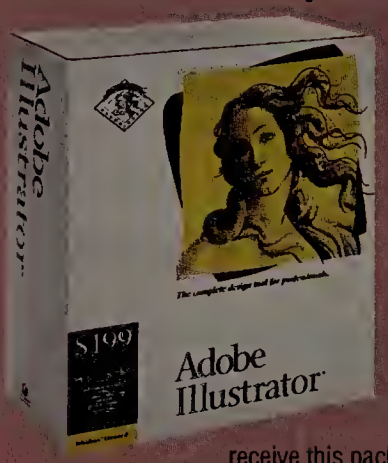

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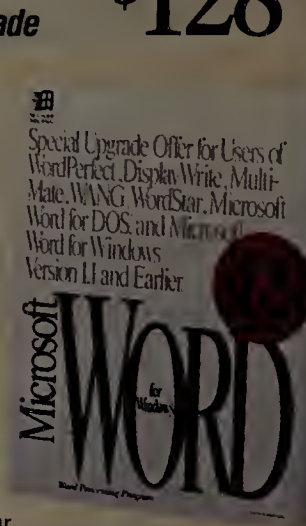

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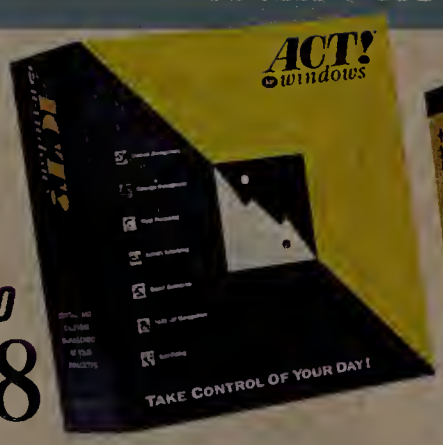

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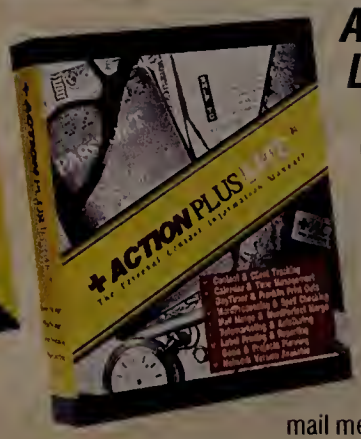

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August 1990
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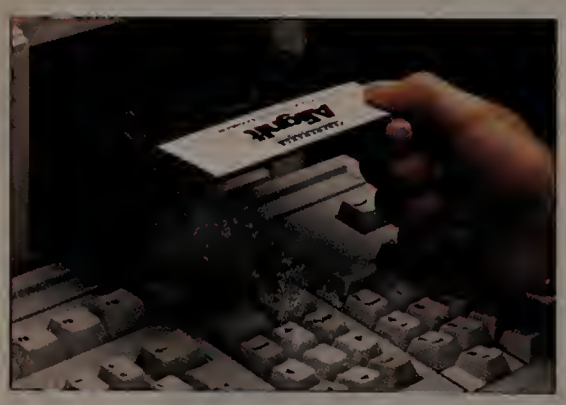

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PARADOX *for* WINDOWS

The first heavy-duty DOS data manager to go graphical, Paradox for Windows promises to take the pain out of data management.

BY CELESTE ROBINSON

Paradox is the number one relational data manager on the market today, with a richly deserved reputation for mixing power with ease of use. So Borland International's decision to put a *Windows* face on *Paradox* has users everywhere understandably excited. It turns out that their excitement is entirely justified: *Paradox for Windows'* impressive graphical user interface makes it simple to get at all kinds of data—even if you're just a novice.

Paradox for Windows, however, isn't just an old product with a new face. It's fundamentally a new program, complete with a slew of major additions that old-guard *Paradox*ers have been clamoring for: memo fields, drop-down menus, and cut-and-paste editing, along with vastly improved form and report designers. It handles both *Paradox 3.5* and *dBASE* files, makes it easier to define relationships between files, and includes a new programming language,

MIRKO ILIĆ

ObjectPAL. And *Paradox for Windows* takes advantage of Object Linking and Embedding (OLE) and Dynamic Data Exchange (DDE) to swap data with other applications.

A WHOLE NEW FACE

The new features make *Paradox for Windows* fly, but it's the revamped interface that makes it soar, especially for *Windows* users, who'll instantly feel at home. Of course, *Paradox for Windows* sports the standard *Windows* look, complete with drop-down menus and resizable, scrollable windows. Just under the main menu is a context-sensitive button bar—called a SpeedBar—that lets you access frequently used functions quickly, without having to navigate menus.

As with Borland's recently released spreadsheet *Quattro Pro for Windows,* you can right-click on any *Paradox for Windows* object (a field, a box, or a grid line, for example) to bring up a dialog box where you can check or change the object's color, font, commands executed under certain conditions, or other properties. Called Menus on Demand, these dialog boxes display only the properties applicable to the current object.

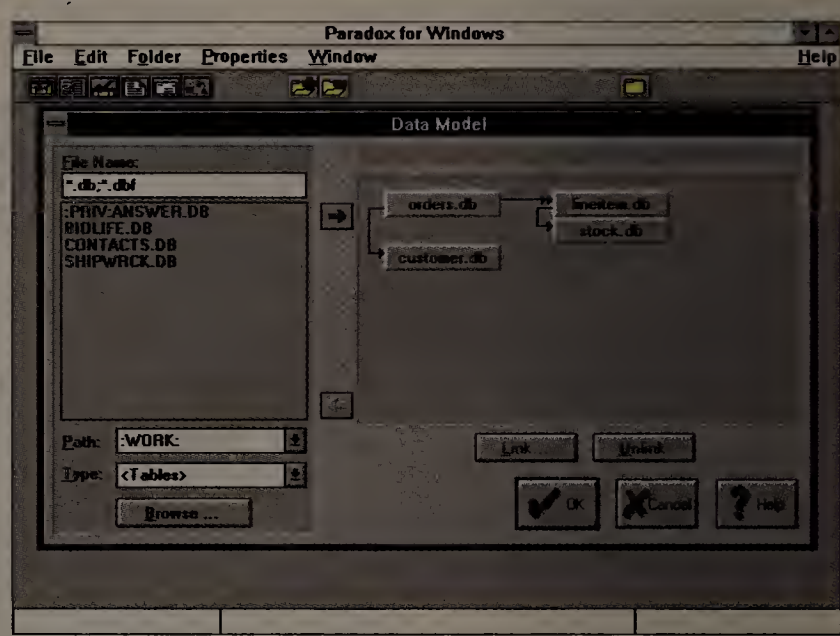
Features such as a file browser and folders make it easier to keep track of your work. When you open a folder, for example, you see icons for objects such as tables, forms, and reports in the current work area. To access an object or launch an application, just double-click on its icon.

NEW WINDOWS ON FORMS AND REPORTS

The forms and reports in previous versions of *Paradox* for DOS were a pain to use: You couldn't cut and paste, use tabs, copy fields, or create lines or boxes. And you were limited in how many levels of relationships you could define between data tables. *Paradox for Windows* changes all this. You now get everything that was missing, along with lots of extras, like the capability to place graphics on a page, and menu-driven facilities for defining drop-down menus, buttons, and check boxes.

A new set of design tools gives you a whole group of paint program–type features that you might not want your kids to discover: You can spend hours just playing with colors, shapes, and fonts. And you can use the same design window to create forms, reports, and mail merges, so you don't have to learn different sets of commands for producing these objects.

Menus on Demand are part of Paradox for Windows' new look; you can right-click on any object to display a menu of changeable attributes such as color, font, and size.



The Data Model tool lets you define multiple levels of table relationships for forms and reports, and it will automatically link tables using matching key and index fields.

With *Paradox* for DOS, to report on selected records from a table, you had to perform a query, copy a report to the resulting answer table, and finally generate the report. Even automating this process was relatively awkward; you had to either record your keystrokes or write a script. With *Paradox for Windows,* viewing or reporting on selected records becomes a more straightforward, one-step process—you simply design a report based on a query that you've already saved.

THE NEW FEATURES MAKE PARADOX FLY, BUT IT'S THE REVAMPED INTERFACE THAT MAKES IT SOAR.

Tools that make your data look good are fun, but the real question is, can you easily link files and massage data as needed? The answer is yes. With *Paradox for Windows,* you can "draw" relationships between tables using the new Data Model tool, as long as the proper indexes are set up. The product automatically links tables on their matching fields.

The Data Model tool also lets you base forms, reports, and mail merges on a query instead of on a table or a group of tables. Just select *Queries* from the Type menu to display a list of saved query objects. When you choose a query from the list, all tables included in the query are automatically used for your document, their links already defined.

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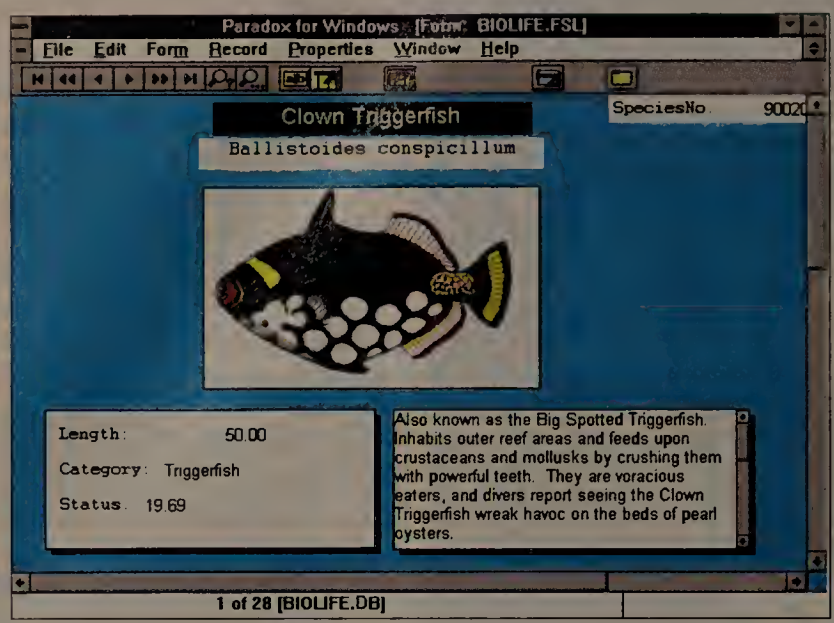
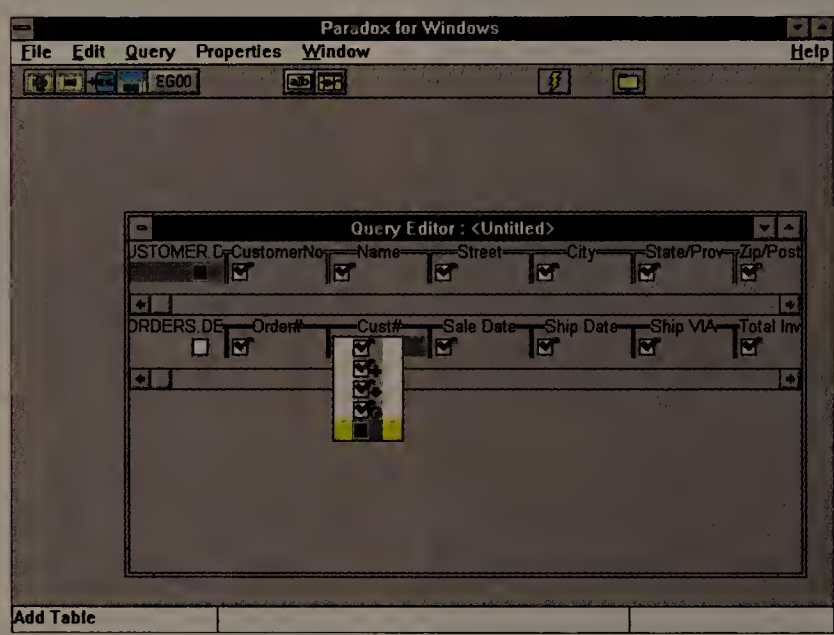


Paradox for Windows makes it easy to include graphics and memos in fields. You can dress up your reports with colors, images, and fonts.



The Query Editor looks familiar but offers new features like drop-down menus for checking fields and SpeedBar buttons for creating and placing example elements in queries.

NEW DATA TYPES

The old *Paradox* limited field types to alphanumeric, date, currency, and numbers. No more. *Paradox for Windows* supports variable-length data fields, including memo fields, formatted memo fields (to store attributes such as font, style, and color, as well as text), graphics, and OLE fields to hold data from other *Windows* applications.

Paradox for Windows gives you greater control over your data and better data integrity than *Paradox 3.*x. In the past, for example, *Paradox* enforced referential integrity (a feature that lets you maintain common values in tables that are used together) only through the use of special forms. When you accessed a table through one of these forms, the tables related in the form were "link locked." This kept data in shape, but you couldn't view your data through any other form.

Paradox for Windows, on the other hand, makes it much easier to ensure that data gets entered the way you want it and stays that way. When you create a table, you can control the integrity of the data by defining features such as validity checks, table lookups, and referential integrity. You control what a user is permitted to enter in a table and whether linked tables are updated automatically whenever a table is accessed. By including these checks with a table, rather than in a form, you get data integrity without the inconvenience of form locks.

With the old version of *Paradox,* the order in which you could view a table was limited. Now you can view a keyed table by an alternate sort order, thanks to a dialog box that lets you define secondary indexes when you create a table.

If the *Paradox* tables aren't enough, you can also create *dBASE*-type tables. A new technology called BOCA—Borland Object Component Architecture—lets applications share objects such as forms and reports and allows for access to both *dBASE* and *Paradox* tables. A word of caution, however: The validity checks and referential integrity options you can use with *Paradox* tables are not available for *dBASE* tables.

QUERIES: A FAMILIAR FACE

One of *Paradox*'s biggest innovations was its use of query by example (QBE)—a method of asking for certain information in your data base by checking off the fields you want to examine and giving an example of the type of data you'd like to see. Now you create queries in a Query Editor window, but the process is basically the same: You still use check marks and example elements to tell *Paradox* what information you want.

Some new query features in *Paradox for Windows* will please all *Paradox* users. The SpeedBar in the Query Editor window lets you add or remove tables quickly. Buttons for creating, copying, and using example elements speed the creation of a complex query. And you can tell *Paradox* whether to create a *Paradox, dBASE,* or SQL-type answer table, or how to order answer-table fields, using another button.

A NET GAIN

Users were often frustrated by *Paradox*'s insistence on restarting a query if the program detected a change in the query tables—a problem if you needed information from a table that was frequently updated by other users on a network. With *Paradox for Windows,* you can specify how you want the query to be handled under these circumstances. The query can be restarted, canceled, or run without regard to subsequent data changes. And developers will be happy to know that the dreaded form locking is gone. That means network users are no longer restricted to viewing linked tables from one form at a time, making it easier to develop multiuser applications.

A FLEXIBLE NEW LANGUAGE

Paradox for Windows features a new programming language, ObjectPAL, which, not surprisingly, is object oriented. ObjectPAL is similar to PAL (Paradox Application Language) but includes event-driven commands that provide more control

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over how data base tasks are handled. According to Borland, ObjectPAL also makes it easier to develop and update applications. Unfortunately, the PAL scripts written in *Paradox*'s earlier DOS versions won't work in the *Windows* version. It's possible, however, to launch a PAL application from *Paradox for Windows;* you can include an icon for the old application in a folder and use this to access *Paradox* for DOS in a window.

Once developers are over the hump, though, they will probably find that ObjectPAL is more flexible than its precursor. Instead of having to create a hierarchy of programs for an application, for example, you can attach ObjectPAL commands—called Methods—that tell *Paradox for Windows* what to do when a user opens a window or clicks on a button.

The new editor is yet another treat for *Paradox* developers. You can still tie in the text editor of your choice, but you may not need to anymore. With the cut-and-paste facilities of the new editor, you can copy text from templates of ObjectPAL commands and modify them as needed.

Paradox for Windows' debugger is also a big improvement. You can set break points on your programs, trace commands as they are executed, and display code from a Method other than the one being executed. In addition, you can tell the debugger to step through all the lines in a procedure or Method, or execute a call to a procedure or Method as one step.

The new Object Browser lets you check the relationships between the many objects that may be part of a *Paradox for Windows* application. And for sophisticated developers, *Paradox for Windows* Methods can call Dynamic Link Library (DDL) functions written in languages such as C and Pascal.

DOS USERS: REV UP YOUR HARDWARE

If you want to go the *Paradox for Windows* route, you may first have to shell out for some hot hardware. The new *Paradox* needs a fast 386—or, better yet, a 486—with plenty of RAM and disk space, especially if you plan to use graphics files.

Still, *Paradox for Windows* is nothing if not seductive; it's easy to get caught up in all the new things you can do with colors and graphical objects on forms and reports. But when using a relational data base program like *Paradox* to manage linked files, the true test is whether it offers enough flexibility to manage data without jumping through unnecessary hoops.

Fortunately, *Paradox for Windows* goes a long way toward fulfilling this promise. With its solid query by example and friendly *Windows* interface, it's a great product for new data base users. And *Paradox* for DOS users willing to learn a few new keystrokes will find almost everything they wished for in their old version.

Celeste Robinson is a contributing editor for PC World.

WHERE TO BUY

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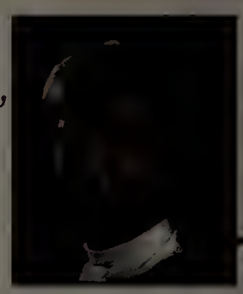

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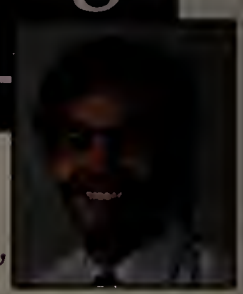

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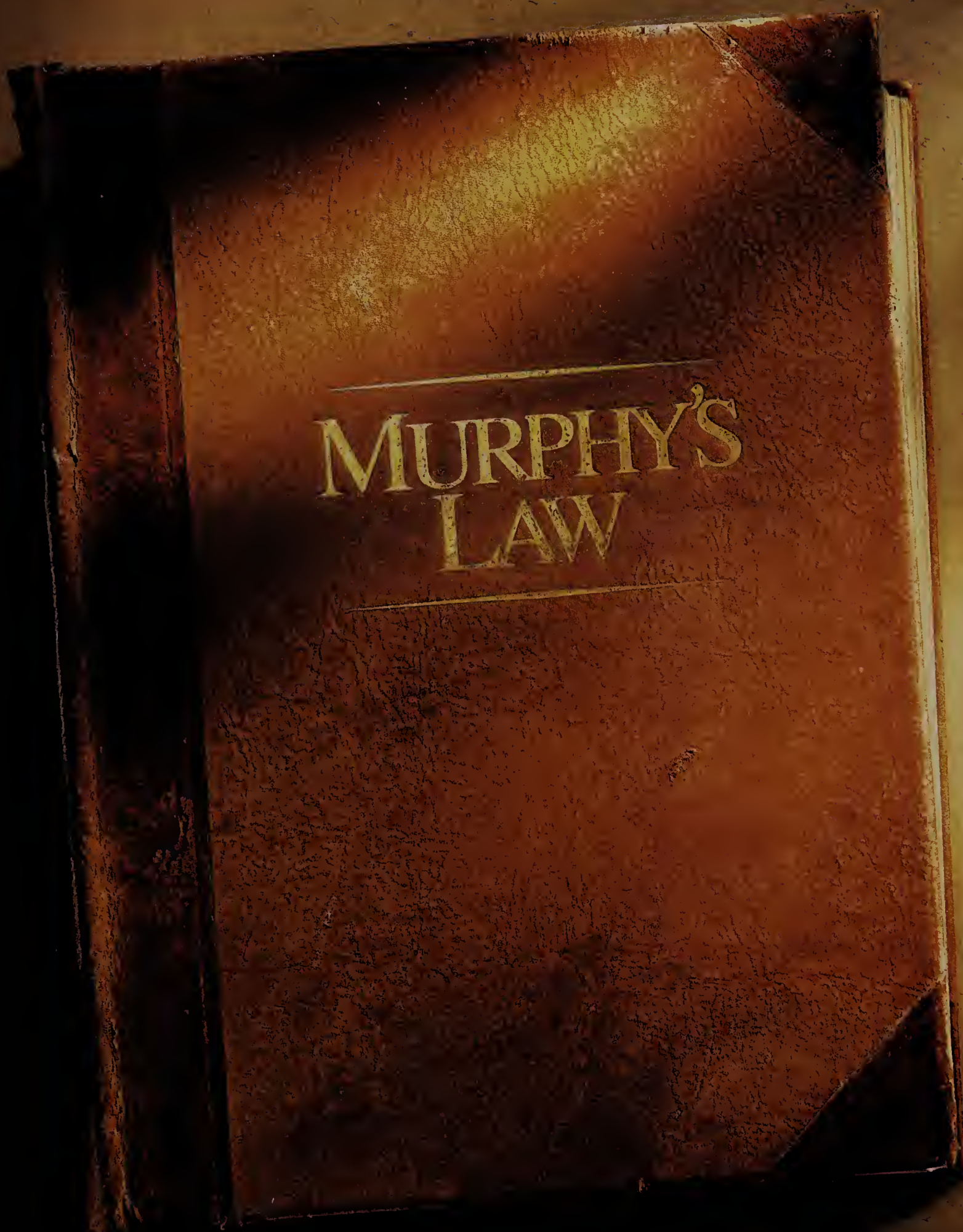

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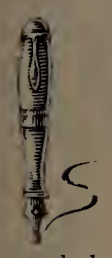
MURPHY'S LAW # 7

THE ONLY PRODUCTS YOUR COMPUTER WILL NOT WORK WITH ARE THE ONES YOU REALLY NEED.

INTRODUCING GUARANTEED COMPATIBILITY.

We've discovered a common phobia among computer shoppers. They're afraid the computer they're about to buy won't run everything they'll need in the future.

At Dell, one of our main goals when we design systems is compatibility. We have a state-of-the-art lab where our engineers do nothing but make sure our computers run other vendors' products. We configure our systems with third-party boards and hundreds of packages in virtually every possible permutation. With thousands of configurations behind our computers, we often find situations that will "break" the system. Then we find a way to make it all work, so you don't have to.



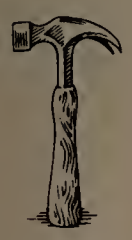
For particularly tough situations, we can rewrite parts of the BIOS for you.

We also have strategic relationships with the people who make those new products. For example, if you have a problem with system software from Novell, Banyan, SCO, Microsoft or IBM, we'll use our alliances with these companies to bring everyone together to solve your problem.

We guarantee we'll work with you to ensure compatibility with products introduced in the future.

WHAT ABOUT NEW PRODUCTS? As we said, our systems are designed to be compatible today and tomorrow. But if a new product is released, and your system is not compatible, we can provide free BIOS changes, if that will make them work together. For complex situations, we can modify the BIOS for you. And for the particularly tough problems, we have specialists in areas such as networking, UNIX® and graphics. No one can predict the future. But we'll do everything we can to make your system compatible as quickly as possible.

DOESN'T ANYONE ELSE GUARANTEE COMPATIBILITY? In a word, no. Oh sure, you could probably squeeze a few vendors for some compatibility assurances. But when you try to get them in writing, they're a bit tougher to get.



We constantly create compatibility situations that will "break" the system, then find a way to make it work—so you don't have to.

OUR COMPATIBILITY GUARANTEE: Dell systems are designed and tested to run all standard operating systems, application software, peripherals and network operating systems developed for ISA and EISA architecture systems. If you encounter a compatibility problem with your Dell Performance Series system within three years of the original purchase, we guarantee Dell's engineers and technicians will work with you to identify the cause of the problem and recommend a solution. If the problem (other than software support for device drivers) can be solved by updating your system, we'll provide the change at no charge. Or, in the rare event we can't do that, you may return the system for a refund. You understand that we can't extend the guarantee to software or devices that were never intended to run on comparable ISA or EISA systems of the same vintage.[1]

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[1]*Refund value is based on the sum of years digits depreciation of the original purchase price over a three-year period, calculated monthly. Refund offer is valid for registered owners of Dell Performance Series systems purchased after July 1, 1992. Guarantee not applicable outside the U.S. and subject to change without notice.*

MURPHY

THE MORE DESPERATE YOUR PHONE CALL, THE LONGER YOU WILL BE PUT ON HOLD.

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Having trouble formatting your hard disk? Need somebody to explain the mysteries of MS-DOS 5.0? Can't set your modem switch?

If you have a Dell computer, you can call us and get all the help you need without umpteen call transfers or endless choruses of "Tie A Yellow Ribbon." We've put together a remarkable system that enables our trained technicians to solve most reported problems over the phone, usually in 10 minutes or less.

It works like this: Calls made to Dell Technical Support are entered into our system. If our technicians run into a problem they can't solve, they access the Problem Resolution Database. Chances are a similar problem—and solution—have been entered in the past. We also keep a complete history of your own computer. Over time, we'll get to know your system as well as you do. Maybe even better.

We solve most problems over the phone within 10 minutes.

And the price of your system includes 7 day-a-week, 18 hour-a-day,* toll-free phone support for as long as you own your Dell computer.

THE DELL WHATEVER-IT-TAKES APPROACH TO CUSTOMER SATISFACTION begins the moment you receive your computer. For the first 30 days, you'll have a special toll-free Getting Started Helpline* staffed by people who speak plain English, not Fortran. If you need system information, it's available 24 hours a day via our innovative TechFax line. Just dial up and the detailed information you requested will be automatically faxed to you from the Dell Technical Library. We also have our own Dell Forum on CompuServe's Information Service so you can see other users' problems, and more importantly, our solutions.

24-hour system information is available on our TechFax Line.

All these services haven't gone unnoticed by our customers. We've won *PC Week's* Customer Satisfaction Poll an unprecedented eight times, won *PC World's* World Class Award for Best Service, and ranked among the top of *PC Magazine's* customer service and reliability survey.

OUR RESPONSE GUARANTEE: We guarantee when you call our technical support center with a problem during operating hours (6AM-12 Midnight CT daily),* you will talk to a technical specialist within 5 minutes. If you do not wish to hold for a technician, we guarantee your call will be promptly returned by a technical specialist within one hour. In the rare event you don't reach a technician or a technician doesn't call back within one hour, let us know and you will receive your choice of a check for $25 or a credit of $25 toward your next purchase.[2]

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[2]*This guarantee begins August 1, 1992 and applies to registered owners of Dell Performance Series systems purchased after July 1, 1992, but only one award per system per day. Please understand that the guarantee does not apply to support calls missed for reasons clearly outside of our control, such as power outages and interruptions to telephone service; or outside the U.S. Subject to change without notice.*

MURPHY'S LAW #3

THE MORE
URGENT THE
PROBLEM,
THE LONGER
IT WILL
TAKE FOR
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INTRODUCING GUARANTEED NEXT-BUSINESS-DAY SERVICE.

We heard what people had to say about service they've had elsewhere, and it wasn't very nice.

So instead of giving you the usual reliability story, we'll give you the straight scoop.

We guarantee a trained technician will be at your desk by the end of the next business day, if needed.

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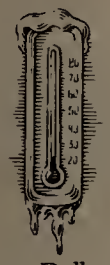

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HERE'S A NOVEL IDEA: WE'VE DESIGNED THEM SO THEY WOULDN'T BREAK DOWN. For added confidence, we design our systems from the ground up rather than rely on dubious imports. With quality components rather than the rejects some vendors pick up on the open market.

Every Dell system is tested for extremes of heat, cold, vibration and shock. It features specially designed air cooling systems to keep noise and temperature levels low. Highly integrated systems boards minimize the number of connections and parts, so there are fewer things to go wrong.

OUR SERVICE GUARANTEE: If there is a hardware failure with your Dell system while under a service contract purchased from Dell and you notify us before 5:00 PM CT, a technician, if needed, will arrive to address your problem by the end of the next business day. In the rare event the technician does not arrive as promised, let us know and your situation will receive top priority for resolution, plus you will receive an additional month of service at no cost to you.[3]

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MURPHY'S LAW #6

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FROM YOUR
COMPUTER
COMPANY,
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IT'LL BE
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If someone ever does a survey to find the response most hated by a computer company's clients, it will probably be this: "It can't be done."

Companies that say things like that put their rules before your problems.

At Dell, we put your problems before our rules.

Depending on your circumstances, we offer a variety of specialized services like comprehensive system integration and preconfiguration, and preloading of popular and custom software.

If, after 30 days, you're still not happy, we'll give your money back with no questions asked.

GET MICROSOFT, INTEL AND NOVELL TO WORK FOR YOU. We have close working relationships with industry leaders like Microsoft, Intel and Novell, and can enlist them to help plot a corporate IS strategy.

With the help of other business partners, we can do things like tailor a support package for you or arrange remote diagnostics for remote sites.

Our flexibility goes beyond our own products. For large projects, we can acquire and integrate over 5000 non-Dell products, so you don't have to go to a hundred different vendors to get your system together.

We're more flexible, to help you get the most out of your computing.

OUR SATISFACTION GUARANTEE: To show you we mean what we say, we'll give you a 30-day, no-questions-asked, money-back guarantee with each computer.

THE LAST GUARANTEE. Computer companies are notorious for broken promises. So, as you've read, we're not making promises. We're making guarantees. Guaranteed compatibility. Guaranteed quick answers. Guaranteed fast service. And guaranteed satisfaction.

Our philosophy of putting your problems before our rules is why two-thirds of the FORTUNE 500® buy from Dell. It's a philosophy that made us an $890 million company. And it's a philosophy we'll continue.

We guarantee it.

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*Getting Started Helpline, extended hours for toll-free phone support, and Critical Care Service available beginning 8/1/92. △Service provided by BancTec Service Corporation. On-site service may not be available in certain remote locations. ◇Leasing arranged by Leasing Group, Inc. i386, i486 and the Intel Inside Logo are trademarks of Intel Corporation. UNIX is a registered trademark of UNIX System Laboratories, Inc. in the United States and other countries. Novell and NetWare are registered trademarks of Novell, Inc. MS-DOS and Microsoft are registered trademarks and Windows and BallPoint are trademarks of Microsoft Corporation. FORTUNE 500 is a registered trademark of The Time Inc. Magazine Company. Dell disclaims proprietary interest in the marks and names of others. ©1992 Dell Computer Corporation. All rights reserved.

200MB

Hard Disks

IF WINDOWS AND ITS APPLICATIONS ARE ABOUT TO BURST THE SEAMS OF YOUR HARD DISK, SEW UP A SOLUTION WITH ONE OF THESE 170MB TO 250MB DRIVES.

BY GEORGE CAMPBELL

Even in the best relationships, there comes a time when you simply need more space. And if you're in love with *Windows*, be prepared to kiss your old 40MB or 80MB hard disk good-bye.

Windows applications are such notorious disk hogs that even a 100MB drive can't handle a full suite of *Windows* applications and leave enough room for your data. As *Windows* runs, it often uses your hard disk as virtual memory, creating huge swap files. Applications also create large temporary files, making even further demands on available disk space.

Meanwhile, data files are growing. Scanned images start around 1MB, and multimedia files containing full-motion video or digitized sound can be enormous. If you're beginning to use more graphics-oriented applications like presentations, multimedia, or color desktop publishing, you'll need all the space you can get.

Fortunately, there's a quick solution for your storage woes. A 200MB drive will take care of your needs now and well into the future. With clock-speed doublers for 486s, graphics accelerators that make *Windows* screens fly, and ingenious new CPU upgrades for 386s, you'll likely hang on to your current system for a long time, which means you should consider expanding your storage space as well.

Most 200MB drives are a real bargain—many cost about $600 on the street, just $200 or so more than many 100MB units. We've rounded up 33 hard drives ranging from 170MB to 248MB, all featuring built-in interfaces with IDE or SCSI controllers for

ARNOLD TIOSEJO

Hard Disk Shopper's Checklist

Before you order a new drive, make sure it's going to be compatible with your current system. Check these items on your system and with the vendor:

HARDWARE COMPATIBILITY: Does your current drive interface match your new drive's? If not, you'll need a host adapter card and new cables.

SOFTWARE COMPATIBILITY: Will it work with your operating system, BIOS, and network software? Make sure drivers for SCSI and external drives are included.

SIZE: Does the drive fit inside your system? A full-height drive won't squeeze into a half-height drive bay, and you'll need a mounting adapter to install a 3½-inch drive in a 5¼-inch drive bay.

DATA BACKUP: Backing up a 200MB drive can take up to 138 high-density floppy disks and more than 5 hours. The boredom alone might prove fatal. An easier, faster solution is a tape backup drive, such as Colorado Memory Systems' Jumbo 250, which costs around $350.

top performance. Prices vary wildly—from $3 to $8 per megabyte—but dealer discounts can chop 25 percent or more off the price. Some manufacturers sell their drives only through third-party dealers, so there's no list price. Once you decide on your drive model, shop around for the best deal. Here's what to look for.

THE ABC'S OF HARD DRIVES

Thanks to fundamental improvements in technology, today's hard drives are much faster, sturdier, and more capacious than those of even two years ago. Most drives then

170MB TO 250MB IDE/SCSI HARD DISKS

				LIST PRICE		SIZE		SPEED	
Company	Product	Capacity (MB)	Interface	Price	Price of host adapter	Width (inches)	Height	Average access time (ms)	Data transfer rate (mbps) [1]
CMS ENHANCEMENTS	K200A3I3	212	IDE	$1369	included	4	third	16	1.5
	K200a3-3540	212	IDE	$1199	n/a [3]	4	half	14	1.5
	K200-53	200	SCSI	$1349	$649	4	third	16	10
	K160S1	200	SCSI	$1419	$679	4	third	16	10
CONNER PERIPHERALS	Jaguar 170 CP-30170E	170	IDE/SCSI	n/a [4]	n/a [3]	4	third	17	2
	Cougar 210 CP-30200	210	SCSI-2	n/a [4]	n/a [3]	4	third	12	2.5
	CP-3200F	213	SCSI	n/a [4]	n/a [3]	4	half	16	1.5
	CP-3204F	213	IDE	n/a [4]	n/a [3]	4	half	16	1.5
CORE INT'L	LAN1T230 (external)	230	SCSI	$1790	n/a [3]	5	[6]	13	1.5
	3HC230	230	SCSI	$1395	n/a [3]	3½	full	13	1.5
CUMULUS	124280	200	IDE	$1250	n/a [3]	3½	half	14	1.5
	124257	200	IDE	$1300	n/a [3]	3½	half	16	1.25
	124259	200	IDE	$1300	n/a [3]	3½	half	15	1.25
	124351	200	SCSI	$1350	n/a [3]	3½	half	15	1.25
	124361 (external)	200	SCSI	$1550	n/a [3]	3½	[6]	15	1.25
	124703	200	SCSI	$1450	n/a [3]	3½	half	16	1.25
	124732 (external)	200	SCSI	$1650	n/a [3]	3½	[6]	16	1.25
MICROSCIENCE INT'L	7200	201	IDE	$595	n/a [3]	4	half	18	1.25
PERISOL TECHNOLOGY	DS213SPS2	213	MCA/SCSI	$944	included	4	half	15	6
	DS213SESA	213	EISA/SCSI	$1211	included	4	half	15	6
	LS213S	213	SCSI	$816	included	4	half	15	6
	LS213A	213	IDE	$711	included	4	half	15	6
PROCOM TECHNOLOGY	MD240	240	SCSI	$1595	$349 [7]	3½	[6]	15	2
	Propaq200	210	IDE	$1085	$359	3½	half	16	5
	Si240	240	SCSI	$1525	$349 [7]	3½	half	15	2
QUANTUM	ProDrive LPS240AT	245	IDE	$785	included	4	third	16	5
	ProDrive LPS240S	245	SCSI/SCSI-2	$830	n/a [3]	4	third	16	10
SEAGATE TECHNOLOGY	ST1239A	211	IDE	n/a [4]	$30	4	half	15	4
	ST3283A	245	IDE	n/a [4]	$30	4	third	12	6
	ST3283N	248	SCSI-2	n/a [4]	$200 to $300	4	third	12	10
STORAGE DEVICES	SHD-209 (external)	213	SCSI/parallel	$899	included	3½	[6]	16	4
WESTERN DIGITAL	WDAP4200	212	IDE	$899	n/a [3]	3½	half	15	5
	WDSP4200	210	SCSI	$899	n/a [3]	3½	half	15	5

n/a = not available

[1] Performance may vary depending on motherboard.
[2] Compatible with all disk defragmentation software.
[3] Uses third-party host adapter.
[4] Not sold directly; pricing set by vendors.
[5] Available through vendor.
[6] External.

employed a modified frequency modulation (MFM) read/write scheme. Now virtually all drives use run-length limited (RLL) encoding, which parks 50 percent more data on the same physical space, boosting capacity and drive speed.

Old MFM drives used separate controller cards. The controlling electronics have shrunk, and manufacturers have moved them onto the drive. With 200MB devices, you have a choice of two interfaces: imbedded drive electronics (IDE) or small computer system interface (SCSI) drives. Which you choose depends on the system you have now and the type of peripherals you plan to add later.

Most PCs now come with a connector for IDE drive cables built into the motherboard and support IDE in the system BIOS. If you've got an IDE-ready system, that interface is probably your best bet. (If unsure, call your vendor, or pop the hood on your PC—if the current drive's ribbon cables attach to the motherboard, it's an IDE.) If your PC lacks an IDE interface, you'll need to buy a separate IDE card that plugs into an expansion slot; most cost less than $50.

A SCSI interface, on the other hand, is rarely on the motherboard. You can get inexpensive SCSI boards bundled with the drive or buy them separately for around $50; others feature sophisticated data caching and cost another $600 to $700. You'll also need to install a device driver in your CONFIG.SYS file, which can make installation a tad tricky depending on the drive. The advantage to SCSI is that a single interface board can handle up to seven SCSI devices, including additional hard disks, CD ROM drives, tape backup systems, and scanners. (Without special electronics, a system can't handle more than two IDE drives.) An improved version, SCSI-2, offers much higher throughput—ideal for systems that move around huge chunks of data, such as network application servers or multimedia PCs. SCSI-2 drives and adapters are typically more expensive.

If your storage requirements are massive or you plan to add other SCSI devices to your system, SCSI is the way to go. However, because specifications vary from vendor to vendor, check with manufacturers to ensure compatibility between peripherals and your SCSI adapter card.

Size of on-boord buffer (K)	Compatible with aptimizing saftware [2]	MTBF	Warronty (years)	Money-back guarantee	Manufacturer-based custamer suppart	Reader service number
0	Y	50,000	1	Y	Y	720
0	Y	50,000	1	Y	Y	720
0	Y	100,000	1	Y	Y	720
0	Y	100,000	1	Y	Y	720
64	Y	150,000	1	Y [5]	Y	721
256	Y	150,000	1	Y [5]	Y	721
64	Y	150,000	1	Y [5]	Y	721
64	Y	150,000	1	Y [5]	Y	721
0	Y	150,000	5	N	Y	722
0	Y	150,000	5	N	Y	722
0	Y	86,000	1	Y [5]	Y	723
0	Y	50,000	1	Y [5]	Y	723
0	Y	70,000	1	Y [5]	Y	723
0	Y	70,000	1	Y [5]	Y	723
0	Y	50,000	1	Y [5]	Y	723
0	Y	50,000	1	Y [5]	Y	723
0	Y	50,000	1	Y [5]	Y	723
32	Y	60,000	1	N	Y	724
32	Y	150,000	1	Y	Y	725
32	Y	150,000	1	Y	Y	725
32	Y	150,000	1	Y	Y	725
32	Y	150,000	1	Y	Y	725
256	Y	100,000	2	N	Y	726
256	Y	100,000	1	N	Y	726
256	Y	100,000	1	N	Y	726
256	Y	250,000	2	Y [5]	Y	727
256	Y	250,000	2	Y [5]	Y	727
32	N	150,000	1	N	Y	728
128	N	200,000	1	N	Y	728
128	N	200,000	1	N	Y	728
0	Y	20,000	1	Y	Y	729
64	Y	100,000	2	Y	Y	730
64	Y	100,000	2	Y	Y	730

[7] For MCA or 16-bit ISA buses only; 8-bit ISA adapter $189.

For more information about all products in this table, circle reader service no. 904.

SIZE COUNTS

A hard drive won't do you any good if it doesn't fit in your machine. All internal drives will fit into a full-height 5¼-inch drive bay, though some require inexpensive adapters. If your machine's drive bays are only 3½ inches wide and/or half- or third-height, you'll need a smaller drive. Check with your vendor to make sure necessary adapters are provided or available.

Installing a new drive isn't a tough job, but if the very idea makes you queasy, professional installation isn't expensive; the job takes only half an hour.

DRIVING AT WARP SPEED

The good news here is speed, indicated by the drives' blazing average access times and hefty data transfer rates. On average, the drives in our guide take from 12 to 18 milliseconds to locate data stored on disk. For most applications, 18ms is plenty fast. But if you use an application that accesses the disk frequently—such as a data base or *Windows*—you'll want to pay a few more dollars for a 12ms drive.

A drive's data transfer rate measures how much data can move between the drive and

Mary Sue Will You M

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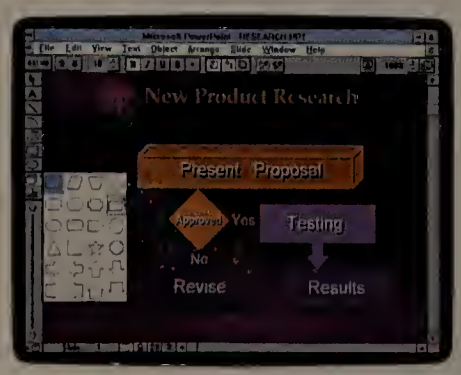

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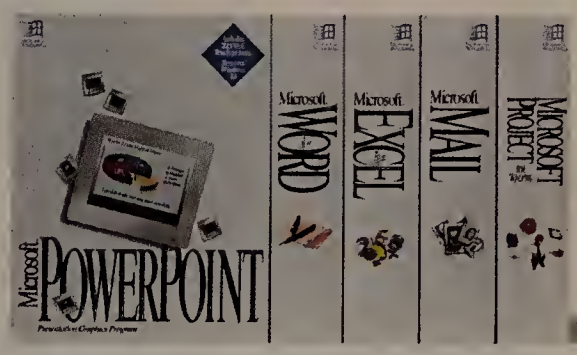

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memory in one second. Transfer rates range from 1.25MB to 10MB per second, but most users won't notice the difference, because a normal AT (ISA) bus can't handle more than 1.2MB per second. If you're working with huge color graphics or multimedia files and you have an MCA or EISA machine, you'll want a drive with a high transfer rate.

To move things along even faster, almost all the drives include an on-board disk buffer. Since the disk can load data faster than the system can accept it, a buffer minimizes the number of time-consuming passes over the same data. Though some SCSI host adapter cards include even more cache memory, they're generally incompatible with software cache programs such as *Windows'* SmartDrive.

Another way to boost drive performance is by using disk optimizing software. As you use any hard drive, files become scattered and fragmented, slowing down data access. Disk optimizing software, such as *The Norton Utilities'* SpeedDisk or *PC Tools'* Compress, herds a fragmented file's parts into contiguous blocks for faster retrieval.

In the past, IDE and SCSI drives experienced conflicts with disk utility software, but those problems are essentially over. Almost all drives in our list are now fully compatible with optimizing software. However, because these drives come with low-level formatting locked in, they won't work with popular disk utilities such as *SpinRite* and *OPTune*.

Today's drives are not only faster but more reliable. Mean time between failure (MTBF) figures are manufacturers' estimates of how many hours a given drive will run before failing. Since a MTBF of 100,000 hours translates to more than 11 years of continuous use, the figures obviously haven't been tested. A better gauge is the length of the warranty and money-back guarantee.

Finally, look for manufacturer-based customer support. This gives you an option in case your vendor can't handle a technical question or simply vanishes into the night.

Hello Windows, Good-Bye Disk Space

Windows eats up hard disk space like a whale swallows krill. A typical suite of mostly Windows applications can consume about 100MB—and that doesn't include disk-hungry data files.

Program	Disk space (MB)
Adobe Type Manager (30 fonts)	6
After Dark	2
Ami Pro 2.0	10
CorelDraw	12
Crosstalk for Windows	2
dBASE IV	5
Excel 4.0	8
Freelance Graphics for Windows	11
MS-DOS 5.0	2
Norton Desktop for Windows	3
The Norton Utilities	2
PackRat	4
Publisher's Paintbrush	4
Ventura Publisher for Windows	12
Visual Basic	4
Windows 3.1	12
Total disk space used	**99**

Hard Disks, Soft Prices

The cost of storing data has dropped like a rock over the past few years. With street prices leveling off for 200MB drives, now is an excellent time to buy.

Year	Price per MB [1]
1987	$25.5 [2]
1988	$19.8 [2]
1989	$13.6
1990	$10.9
1991	$ 6.3
1992	$ 3.5
1993 [3]	$ 2.8

[1] End-user cost for 2[illegible]
[2] Data available for [illegible] only.
[3] Projected
Source: Inte[illegible]ona[illegible] Da[illegible] Corp

SPINNING DOWN

Whether you buy now or later, you'll soon be in the market for a faster, roomier hard disk. Install a 200MB drive, and you'll have the capacity and blazing performance you'll need for years to come.

George Campbell is a contributing editor for PC World.

WHERE TO BUY

CMS Enhancements
2722 Nickels Dr.
Irvine, CA 92715
714/222-6000,
714/222-6226 (fax)

Conner Peripherals Inc.
3081 Zanker Rd.
San Jose, CA 95134
408/456-3265,
408/456-3253 (fax)

Core Int'l, Inc.
7171 N. Federal Hwy.
Boca Raton, FL 33487
407/997-6055,
407/997-6009 (fax)

Cumulus Corp.
23500 Mercantile Rd.
Cleveland, OH 44122
216/464-2211,
216/464-2483 (fax)

Microscience Int'l
1015 E. Brokaw Rd.
San Jose, CA 95131
408/441-1456,
408/441-7515 (fax)

Perisol Technology
3350 Scott Blvd.
Bldg. 1201
Santa Clara, CA 95054
800/447-8226,
408/988-4431 (fax)

Procom Technology, Inc.
2181 Dupont Dr.
Irvine, CA 92715
800/800-8600,
714/852-1221 (fax)

Quantum Corp.
500 McCarthy Blvd.
Milpitas, CA 95035
800/624-5545

Seagate Technology, Inc.
920 Disc Dr.
Scotts Valley, CA 95066
408/438-6550

Storage Devices, Inc.
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Lotus Works™ 3.0	Retail value: $149.00
Lotus Agenda® 2.0	Retail value: $199.00
Lotus 1-2-3 version 3.1+	Retail value: $595.00
Lotus 1-2-3 version 2.4	Retail value: $495.00
Lotus Freelance for DOS	Retail value: $495.00

[1]Requires Microsoft Windows, i386 processor or higher, and 3MB of memory.
[2]Requires Microsoft Windows, i386 processor or higher, and 2MB of memory.

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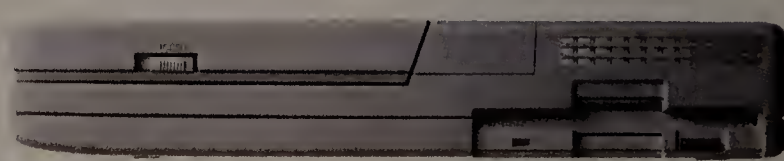

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Display:	14" VGA Color Monitor
Keyboard:	101-key Keyboard
Mouse:	Three-button Mouse
Software:	MS-DOS® 5.0 and MS-Windows™ 3.1

Selected Options:
• Additional 2MB Memory. Add $100 • 1.2MB 5.25" Floppy. Add $75 • Upgrade 122MB Hard Disk to 245MB Hard Disk. Add $200 • Upgrade to 14" Multi-sync VGA Color Monitor. Add $100

DECpc 316sx

Microprocessor:	Intel 1386 running at 16MHz
Memory:	3MB Memory (exp. to 13MB)
Storage:	122MB IDE Hard Disk 3.5" 1.44MB Floppy
Resolution Mode:	1024 x 768 SVGA Adapter with 512K Video RAM
Display:	14" VGA Color Monitor
Keyboard:	101-key Keyboard
Mouse:	Three-button Mouse
Software:	MS-DOS 5.0 and MS-Windows 3.1

Selected Options:
• Additional 2MB Memory. Add $100 • Additional 4MB Memory. Add $200 • Upgrade 122MB Hard Disk to 245 Hard Disk. Add $200 • Upgrade to a 14" Multi-sync VGA Color Monitor. Add $100 • Upgrade to a 16" Multi-sync VGA Color Monitor and 1MB of VRAM. Add $600

DECpc 420sx

Microprocessor:	Intel 486sx running at 20MHz
Memory:	4MB Memory (exp. to 32MB)
Storage:	122MB IDE Hard Disk 3.5" 1.44MB Floppy
Resolution Mode:	1024 x 768 SVGA Adapter with 512KB Video RAM, upgrades to 1MB for 256 color support
Display:	14" Multi-sync VGA Color Monitor
Keyboard:	101-key Keyboard
Mouse:	Three-button Mouse
Software:	MS-DOS 5.0 and MS-Windows 3.1

Selec[illegible]ons:
• Ad[illegible] Memory. Add $200 • 1.2MB 5.25" Flopp[illegible]5 • Upgrade 122MB Hard Disk to 245M[illegible]k. Add $200 • Upgrade to a 16" Multi-sync VGA C[illegible]itor and 1MB of VRAM. Add $600

DECpc 320P Notebook

Microprocessor:	Intel 386sx running at 20MHz
Memory:	2MB Memory (exp. to 8MB)
Storage:	40MB IDE Hard Disk 3.5" 1.44MB Floppy
Display:	TST Backlit VGA
Modem:	2400 bps Data
Keyboard:	84-key Keyboard
Mouse:	Logitech™ TrackMan Portable
Software:	MS-DOS 5.0, MS-Windows 3.1 and Stacker 2.0

Selected Options:
• Upgrade to 80MB Hard Disk. Add $400 • Upgrade to 80MB Hard Disk and 9600 bps FAX Modem. Add $500 • Additional 2MB Memory. Add $175 • Additional 4MB Memory. Add $325 • Additional 6MB Memory. Add $475 • Extra Battery Pack. Add $75

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..... 386 ..... 486 ..... Other ..... Not Sure
How many applications will your PC(s) run in a typical workday?
How many PCs do you anticipate purchasing over the next 12 months? .....
Are you interested in leasing? ..... Yes ..... No
..... Immediately ..... 1 - 3 months
..... 3 - 6 months ..... 6 - 12 months

What best describes the type of work the system will be used for? (Check all that apply)

O Word Processing
O Database (filing records)
O Retail Store Management
O Education
O Engineering
O Scientific Research
O E-Mail
O Order-entry
O Financial Calculations
O Desktop Publishing
O Design (CAD/CAM)
O Industrial Process Control
O Software Development
O Other industry-specific applications (please specify)

Which of these graphics-oriented applications best describes your needs? (Check all that apply)

O Desktop Publishing O CAD/CAM O Animation
O Realtime Modeling O Image Processing
O AutoCad O Business Graphics

How many people work in your group, department or small business?

O Less than 10 O 10-20 O 20-35 O More

Is your desktop operating system:

O DOS O DOS with Windows O OS/2
O MAC O UNIX™
O VMS O Other

LAN Communication:

How many PCs do you have installed? .....
From how many manufacturers? .....
What kinds of connections does your PC(s) require? (Check all that apply)

O Links with other PCs in the immediate surroundings
O Connection to the local area network (LAN) throughout a building
O A line to a host system in a remote location

What kind of media (cable) is used in your LANs today?
What is the networking software now being used in your company?
.....
What kind of host system will your PC communicate with?

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Do you currently have a service contract(s) for your PCs?

O Yes O No

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Chances are you've been working with *Windows 3.0* for a while or are in the process of upgrading to *Windows 3.1.* It's also possible that you've been doing more work than you have to. How do you make sure you're using *Windows* to its best advantage?

We asked our favorite *Windows* experts—including the folks at Microsoft—for tips that help you customize versions 3.0 and 3.1 to make them work better for you. The 20 tips that follow will help you organize your application groups more efficiently, set up your icons the way you like, and manage your files better. They'll also help you use your fonts and printer more effectively, take advantage of *Windows'* built-in color and sound capabilities, and much more.

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Grouping Applications

1 KEEP GROUPS CONSTANT

There's a handy way to keep Program Manager's window size and position on the *Windows* desktop arranged—with all of its group windows just where you like them—every time you launch *Windows*. In *3.0*, get all your group windows in position, select *File•Exit Windows*, click the Save Changes check box if it isn't already checked, and choose *OK* to exit *Windows*. Relaunch *Windows*, but this time when you're ready to exit, uncheck the Save Changes box.

Windows 3.1 takes a much slicker approach. While you can still arrange Program Manager's group windows to your liking, now you can also save the position of its group icons. (One helpful organizational hint: Arrange your group icons along the side of the main Program Manager window rather than along the bottom; it's easier to see all your program groups at once.) Make sure Save Settings on Exit in the Options menu is unchecked. Then press **<Alt>-<Shift>-<F4>**. Your desktop configuration will be saved without having to exit *Windows*. —*Microsoft Windows Team*

Managing Files

2 PUT DOCUMENTS IN PROGRAM MANAGER

Yes, Virginia, you can put data file icons in Program Manager groups. This saves you the hassle of launching an application first and then searching for the file you want to load. For example, if you have a word processing document that contains all your contacts, you can keep an icon representing it in a group; a double-click on the icon will launch the word processing application and load the file. First, position the File Manager and Program Manager windows so you can see them. Then simply drag the document file from File Manager to the appropriate group in Program Manager. The document will use the icon of its parent application. —*Microsoft Windows Team*

3 THE ROUND FILE (3.1)

If you're suffering from Mac envy, *Trash Can for Windows* is the answer. This new utility takes advantage of *Windows 3.1*'s drag-and-drop capabilities to delete unwanted files. Simply drag a file name or group of file names from File Manager—or any application that allows you to drag file names—and drop them on the Trash Can. They're deleted, and you never have to touch the keyboard.

You can obtain the Trash Can from the Utility Download Library on PC World Online and in Library 17 of the CompuServe forum GO WINADV. For help finding the file on CompuServe, use the IBM File Finder. Enter **GO IBMFF** at the CompuServe prompt, and then search for **TRASH.ZIP**. The IBM File Finder will tell you the forum and library where TRASH.ZIP is residing. Download the file, decompress it, and copy the resulting TRASH.EXE file to a directory. Follow the steps in Tip 2 to drag TRASH.EXE into the StartUp group. Click the icon once, select *File•Properties*, and click the Run Minimized box if it's not already checked. When you restart *Windows*, the Trash Can icon will appear at the bottom of your screen. —*Brian Livingston*

4 KEEP FILE MANAGER CONSTANT (3.1)

You can set your own default configuration for File Manager's windows, minimized icons, and other options. First, adjust the position, size, and options for each window to your liking. (A handy way to arrange multiple windows is to select *Tile* from the Window menu.) Then click *Options*, and if Save Settings on Exit doesn't have a check mark in front of it, select it too. Choose *File•Exit*. Restart File Manager, and click *Options•Save Settings on Exit* to remove the check mark. —*Microsoft Windows Team*

5 GROUPING FILES

Don't work harder, work smarter. Keep icons of related files in one group and you won't spend time searching for them. Name your groups by project (i.e., "Q4 Sales" or

TIP 1: To save the Program Manager configuration, uncheck Save Settings on Exit and press <Alt>-<Shift>-<F4>.

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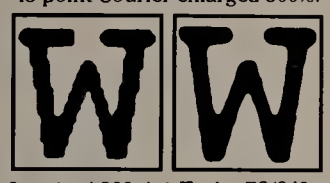

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YOU CAN CHANGE THE HORIZONTAL SPACING BETWEEN ICONS IN PROGRAM MANAGER IN ORDER TO SQUEEZE MORE INTO A WINDOW OR SPREAD THEM OUT FOR GREATER CLARITY.

"August Projects") and you won't waste time trying to find the right group, either. To create a new Program Manager group, select *File•New•Program Group•OK*, type a name for the group window's title bar in the Description box, and click *OK*. Then drag files into your new group (as described in Tip 2). —*Microsoft Windows Team*

6 DITTO DOS (3.0)

If you like to have several Program Manager windows open at once but hate searching for an application you use frequently, keep a copy of the icon in each of the various groups you work in. For example, if you need to get to DOS often, open the Main program group and any other group windows in which you want DOS to appear. Hold down the <Ctrl> key and drag the DOS Prompt icon (or any icon, for that matter) to the desired location. The icon will be copied and will appear in the new group as well as in its original group. —*Steve Fox*

7 KEYBOARD SHORTCUT (3.1)

Windows 3.1 lets you duplicate icons just as you can in *Windows 3.0*, but there's an even quicker way to get the applications you're after. Click on the icon of the application you want to switch to, then select *File•Properties* in Program Manager or press <Alt>-<Enter>. Click the Shortcut Key text box in the dialog box that appears, then press any key. If you press *A*, for example, *Windows* defines the shortcut key as <Ctrl>-<Alt>-A. If you hold down the <Shift> key while pressing the letter, *Windows* incorporates it into the shortcut definition: <Ctrl>-<Shift>-<Alt>-A, for example. You can assign other shortcuts, such as <Ctrl>-A and <Alt>-A, but they may cause conflicts with *Windows* applications that already use them. —*Brian Livingston*

8 RUN DOS BATCH FILES FROM WINDOWS

You can create a PIF file that starts DOS and executes a favorite DOS command or batch file. Double-click on the PIF Editor icon in the Main group and fill out the top line, being sure to include the exact drive, path, and batch file name. Then select *File•Save*, type an appropriate name (don't type a period), and select *OK*.

Once you've set up the PIF file, create an icon for it to make running your batch file easy: Open the Program Manager group in which you want it to appear, choose *New* from the File menu, click *OK* for Program Item. The Program Item Properties dialog box appears. Fill in the Description box, and in the Command Line box type the drive, path, name, and PIF extension of the file you created using the PIF Editor (since your batch file should already have directory information, you can leave the Working Directory box blank); select *Change Icon*. In *3.0*, you can click the View Next button to see more PROGMAN.EXE icons; other files, WINFILE.EXE for example, have other icons. In *3.1*, PROGMAN.EXE icons are displayed on a scrolling bar; you can double-click one to choose it or click the Browser button and select another file, such as MORICONS.DLL in the *Windows* directory, in order to view its icons. —*Kay Yarborough Nelson*

Icons

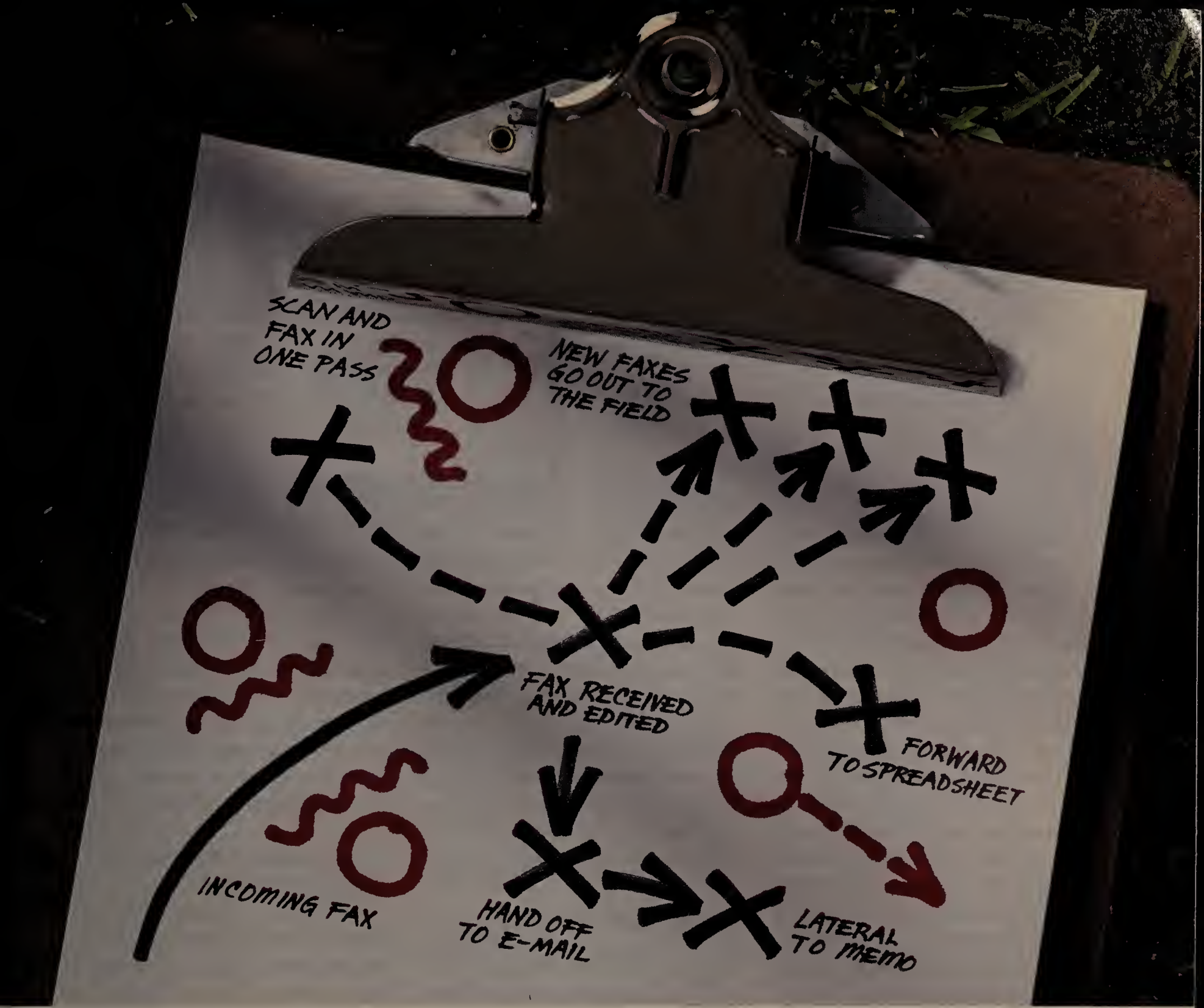
9 TIMESAVING ICONS

Windows' default configuration lures you into the myth of one icon, one program. But you can save time if you create multiple icons to launch different configurations of the same application. For example, you can have one word processing application icon for letters, one for memos, and one for reports.

First, copy the application item: You can use the steps in Tip 6. Or you can select the application icon and press <F8>. In the resultant Copy Program Item dialog box, scroll through the To Group list box to highlight the name of the program group that you want to copy the icon to, and click *OK*.

Click once on the newly made icon, then press <Alt>-<Enter> or select *File•Properties*. Give your icon a name in the Description box and change the shortcut key (if any) and the working directory (e.g., C:\WINWORD\LETTERS). Then

TIP 8: Create an icon that calls a PIF file to start DOS and execute your favorite DOS command or batch file.



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click *OK* to save the changes you've made, and you're ready to rock 'n' roll. —*Scott Dunn*

10 SPACING OUT

You can change the horizontal spacing between icons in Program Manager groups if you want to squeeze more into a window or to spread them out for greater clarity. Go to the Control Panel and select *Desktop*. In the icon spacing box, change the setting from the default 75 to **48**. Select *OK* and you'll see the effects of your changes immediately (in *3.0*, you must also click a group icon and select *Windows•Arrange Icons*). However, keep in mind that when it comes to groups of icons, less is better—the more icons you have in a group, the harder it is on your eyes and your system resources.

In *3.1*, you can also place icons for your open applications higher or lower on your screen. This also affects the placement of icons in Program Manager groups and group icons in Program Manager's main window. Go into the Desktop section of WIN.INI and add the line **IconVerticalSpacing=75**. Exit and restart *Windows*. Try making the number following the equal sign lower or higher; the lower the number, the lower your icons will appear. With a little experimenting, you can position the icons for your open applications just as you like. —*Microsoft Windows Team*

11 CUSTOM TITLES (3.1)

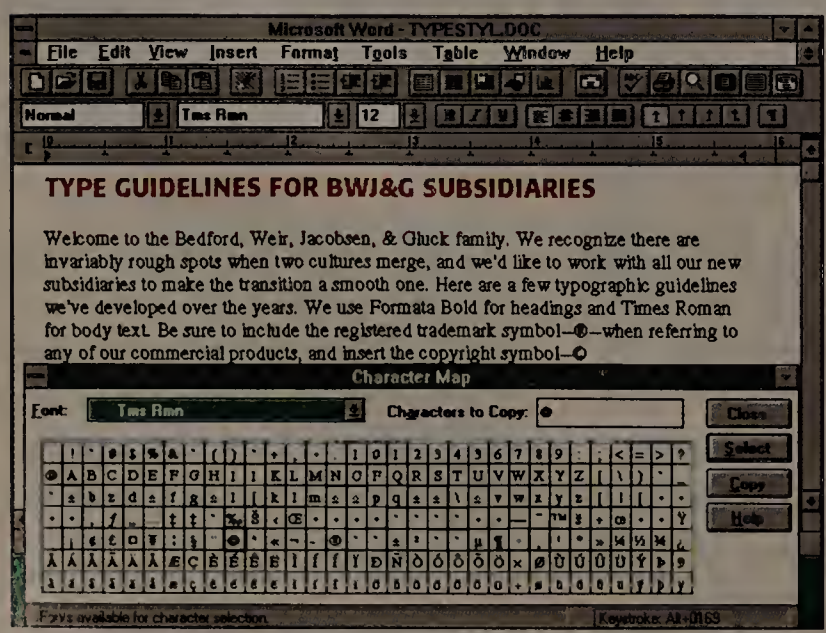
You can modify icon labels' fonts by making a few changes to the Desktop section of your WIN.INI file. For example, try adding the line **IconTitleFacename=Arial**. Then save the change, quit *Windows*, and restart it. You'll notice that your Program Manager icon labels now appear in a different typeface—Arial. You can also change the size of the labels to, say, 12 points by adding the line **IconTitleSize=12**. You can use any *installed* font name and size. To find out which font names are available for you to enter, load Paintbrush and select *Text•Fonts*. —*Microsoft Windows Team*

TIP 13: To enlarge or shrink your DOS window, press <Alt>-<Space>, select Fonts, and choose a new size.

Fonts and Printing

12 NEW CHARACTERS (3.1)

Typically, typefaces have many more characters than your keyboard has keys. However, *Windows 3.1*'s Character Map, located in the Accessories group, lets you access the full range of characters in any installed font. Double-click *Character Map*, then minimize it. Leaving the Character Map icon visible at the bottom of the screen, fire up your word processor in a window and click the desired insertion point in your document. Double-click on the Character Map icon, click on the Fonts list box, and select a face to view its available characters. Double-click each character you want; they will appear in the Characters to Copy box. Click the Copy button, then select *Edit•Paste* in your word processor. Voilà, the new character will appear. —*Brian Livingston*



TIP 12: Use the Character Map in Windows 3.1 to place characters such as a copyright symbol in your document.

13 CHANGE SCREEN FONTS IN DOS SESSIONS (3.1)

When you're running in 386-enhanced mode and initially flip a DOS program from full screen to windowed (by pressing <Alt>-<Enter> or <Alt>-<Space>), you may find that the window for the DOS application takes up too much space. It's an easy matter to change the size of this window to make it smaller.

Go to your DOS application and press **<Alt>-<Space>**. When you select *Fonts* from the menu, the Font Selection dialog box's Window Preview appears (see screen shot above). The dialog box shows you the approximate relative size of your DOS window. Choose a smaller font size (say, 6 by 8 instead of 8 by 12) and click *OK*. Your DOS application will immediately appear in a smaller window. —*Brian Livingston*

14 RUN DOS IN A WINDOW (3.1)

If you like Tip 13 and always want to see DOS or a DOS application in a window, try this: Use the PIF Editor in the Accessories group

(see screen shot below) to edit that application's PIF file (DOSPRMPT.PIF for the DOS prompt). Click on *Windowed,* then choose *Save.* The next time you run the DOS application, you'll be in a window. —*Kay Yarborough Nelson*

15 QUICK PRINTING (3.1)

Print Clip is a free *Windows 3.1* application that sits on the desktop at the bottom of the screen until you need it. This is handy when you see something in a document, and you just want to print one or two paragraphs. (It's especially nice because the *Windows* Notepad can't print just a highlighted section of a text file, and the Clipboard doesn't print at all.) With *Print Clip,* simply drag your mouse over the text in your *Windows* application, click *Edit•Copy* on the application's main menu, and then double-click on *Print Clip*'s icon to send any text presently in the Clipboard to your current printer.

This handy application is stored in a file called PRCL11.ZIP in Library 15 of the GO WINADV forum on CompuServe (using *Print Clip* requires Microsoft's *Visual Basic* run-time utility, which is available in a file called VBRUN.ZIP in Library 15 of the GO ZENITH forum). You can also find both of these files on PC World Online, in the Software Library's Windows section. Use your *PKUNZIP* utility to decompress VBRUN.ZIP, which will generate a file called VBRUN100.DLL. Then copy the file VBRUN100.DLL into your *Windows* directory (you can run any *Visual Basic* application once you have this file in the directory). Decompress the PRCL11.ZIP file, which yields PRINTCLP.EXE and five other files. Place PRINTCLP.EXE in any directory on your hard drive, and drag it from File Manager to your StartUp group in Program Manager, as in Tip 2. The next time you start *Windows,* the *Print Clip* icon will appear minimized at the bottom of your screen. —*Brian Livingston*

TIP 14: If you prefer running a DOS application in a window, edit the PIF file that launches the application.

TIP 16: Define custom colors and apply them to Windows screen elements using the Color icon in the Control Panel.

Sights and Sounds

16 CUSTOM SCREEN COLORS

No one ever said you were limited to using the basic colors and desktop color schemes that come with *Windows.* In fact, most of these are hard on the eyes after a while, so you might want to mix your own lighter shades. Double-click the Color icon in the Control Panel, click on the Color Palette button, and then choose *Define Custom Colors.* You'll see the Custom Color Selector, where you can drag your cursor around to place a color in the Color/Solid box. You can adjust the color to make it brighter or duller by clicking on the arrows on the right side of the box labeled Lum (for Luminosity). Click the Hue and Sat (for Saturation) arrows to change the shade, or click in the Red, Green, or Blue box's arrows to mix different colors. When you've got the color you want in the Color/Solid box, click a box in the Custom Colors palette. Click *Add Color* to add your new color to the palette, and then click *Close.* You can then use that new color in any of your color schemes. —*Kay Yarborough Nelson*

17 SOUND ADVICE (3.1)

Windows 3.1 allows you to associate sounds with events, so that you'll hear, say, a chime on the hour or a cymbal crash when you exit *Windows.* To play these sounds, your computer needs a soundboard supported by one of the sound drivers included with *Windows 3.1.* Fortunately, Microsoft provides a free sound driver for your PC's speaker. Just download the file SPEAK.EXE from the Microsoft Product Support Download Service at 206/936-6735 (which supports modem speeds up to 9600 baud). If you don't have a modem, you can get the complete driver library for $20 by calling Microsoft Sales and Service at 800/426-9400. SPEAK.EXE is also available on PC World Online, in the Software Library's Windows section.

Copy SPEAK.EXE to any directory, locate it in File Manager, and double-click it to expand it (it's in compressed

IF YOU HAVE WINDOWS 3.1, A MICROPHONE, AND AN AUDIO BOARD, YOU CAN INSERT VOICE ANNOTATIONS IN ANY WINDOWS APPLICATION THAT SUPPORTS OLE.

form). To install the resulting SPEAKER.DRV file, double-click the Drivers icon in the Control Panel and click *Add*. Highlight *Unlisted or Updated Driver* from List of Drivers and click *OK*. Type in the path of the PC speaker driver, select *Sound Driver for PC-Speaker*, and click *OK*. Make any speed, volume, and duration adjustments in the resulting dialog box and click *OK* one last time. Restart *Windows*, and the next time you click on the Sound icon in the Control Panel, you'll be able to assign the sounds of your choice by matching an event (on the left) to the sound (on the right). *Windows 3.1* ships with a few sounds, which you can identify by their WAV extension.

A few warnings are in order, however. Since the PC speaker driver may cause problems with communications programs, multimedia packages, or other timing-sensitive applications, you may want to avoid using such programs while the driver is installed. In addition, the sound quality isn't great, but if you don't have a soundboard, this is an easy way to perk up an otherwise dreary *Windows* session. —*Scott Spanbauer*

18 TALKING APPS (3.1)

If you have *Windows 3.1*, a microphone, and an audio board, you can insert useful voice annotations in any *Windows* application that supports Object Linking and Embedding (OLE). To embed a sound snippet in, say, a *Word for Windows 2.0* document, open Sound Recorder in the Accessories group. Either record your message or open a prerecorded WAV file, and select *Copy* from Sound Recorder's Edit menu. Next, switch to *Word for Windows*, place the cursor where you want your annotation to be, and hit the Paste button; the Sound Recorder icon will appear. Click on it once, and then drag the handles to make it larger or smaller if you wish. Send this document to other *Windows 3.1* users via E-mail or sneakernet. If they have a soundboard or sound driver installed, they'll be able to play the sound when they double-click the icon. —*Scott Spanbauer*

Miscellaneous

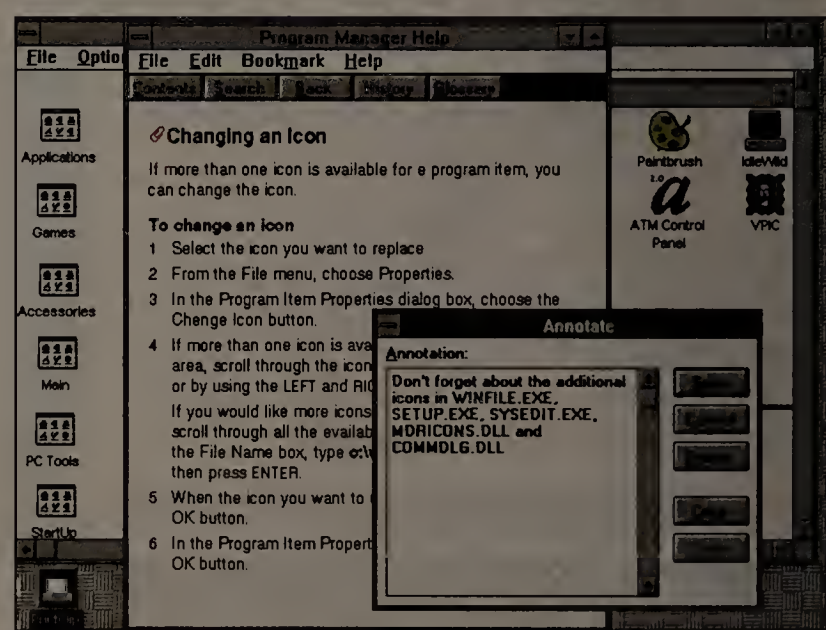
19 CUSTOM HELP

You can use the Annotate function in *Windows* to add Post-it–like notes to the existing and unalterable Help file of most *Windows* applications. Simply choose *Help*, go to the Help topic you want to add a note to, and select *Annotate* from the Edit menu. Just type your notes in the space provided. When you finish, click the Save button (*OK* in *3.0*), and a tiny paper clip will appear next to the Help topic's title to remind you that you've annotated it. —*Kay Yarborough Nelson*

20 DOS SHUT-DOWN

Have you ever tried to shut down *Windows* but been stymied because DOS or a DOS application is still running? If you use an icon to run them, you can exit *Windows* without having to switch to the DOS session, close the application, and type EXIT: Open the PIF Editor and load (or create) the appropriate PIF file. Click the Advanced button and check the Allow Close When Active box. You'll see a stop sign and a warning. (Since you'll lose data if an application closes before you save new data, save your files before exiting *Windows*). Click *OK* to continue and *OK* again to return to the PIF Editor. Select *File • Save* to save your changes, and exit. Now switch to Program Manager and click once on the application's icon. Select *File • Properties*. Edit the entry in the Command Line text box so that it specifies the drive, path, and name of the PIF file you modified, and click *OK*. The next time you close *Windows*, you can simply click *OK* to close your DOS session. —*Microsoft Windows Team*

Scott Dunn is coauthor of 101 Windows Tips *(Peachpit Press, Berkeley, California, 1991). Steve Fox is a senior editor for* PC World. *Brian Livingston is president of Windows Consulting and author of* Windows 3.1 Secrets *(IDG Books, San Mateo, California, 1991). Kay Yarborough Nelson is author of* Voodoo Windows *(Ventana Press, Chapel Hill, North Carolina, 1992). Scott Spanbauer is a contributing editor for* PC World. *Our thanks to Contributing Editor Robert Luhn and the Microsoft Windows Team for contributing to this article.*



TIP 19: With the Annotate function, you can add Post-it–like notes to the topic of your choice in any Windows Help file.

Advertising

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Special Tear-out Edition

From the Desk of Therese Myers, President

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Let's start with the basics, like the interface. Sure, our interface is smaller and faster—and a lot better looking. But more importantly, it was designed to make you more productive. The minute you try it you'll see that it has a uniquely intuitive look and feel. Many people especially appreciate that it is just as easy to manipulate with the keyboard as it is with a mouse.

DESQview/X also increases your productivity by putting you in full control. Your ability to customize every aspect of the DESQview/X interface is one of the most dramatic differences between DESQview/X and every other graphical interface (see "Your Way" box).

Easy to Use

Have you ever noticed how many people claim that their product is easy to use, and how often it just isn't true? When we say that DESQview/X is easy to use we're doing more than just blowing our own horn. Remember, we've been developing and supporting DOS multitasking solutions that really work for a decade—long before MS Windows 3.x appeared on the screen.

We know from experience what works—and what doesn't. With over a million multitasking users and ten years of experience, we've talked to a lot of people and listened to a lot of suggestions. As soon as you turn DESQview/X on you'll see the difference. From the informative and intuitive shapes that the icons take, to the fact that our menus pop up only when you need them. Little touches that make our window intuitive where others are frustrating.

Even more important is the way that DESQview/X empowers you to tailor your work space to your needs. Nothing in DESQview/X is set in stone, you can customize just about everything. From the size of the icons, to the design of the backgrounds, to the menus themselves (see accompanying box).

Full Featured

DESQview/X comes complete with everything you expect in a graphical environment. It starts with a tutorial that you run by clicking on the icon that's labeled 'Tutorial' (pretty clever, eh). The tutorial isn't very long though, because DESQview/X is just so

simple to use. (If you need more, you can always turn to the on-line context sensitive help that is always just a keystroke or a mouse click away.)

DESQview/X's ease of use is further enhanced by the way that it will automatically turn on any program or suite of programs every time you turn it on. Furthermore, programs can be grouped into sets, named and assigned to an icon. This makes it easy to organize and customize your computer.

Compatible and Safe

And DESQview/X is as easy on your programs as it is on you, because DESQview/X lets you run any program you want—you can even run Microsoft Windows! Whether you are using regular DOS applications like dBase or Word Perfect, extended applications like AutoCAD or Paradox, or programs that utilize expanded memory like Lotus 123 or Harvard Graphics, DESQview/X supports your program seamlessly, without any glitches.

Of course, just like DESQview, DESQview/X can protect you from the ill effects of misbehaving programs. If you encounter a fatal program error, DESQview/X can recover gracefully. Activating protection levels (1, 2 or 3) can ensure that only the window in which the error occurred is lost. Simply close the window, or in the most serious cases hit Ctr./Alt/ Delete to eliminate the window.

Fast, and Very Fast

DESQview/X runs most programs, like MS Windows 3.x, in one of two modes: Regular or High Speed. In High Speed mode programs run at very nearly the same speed under DESQview/X that they run in DOS. However, as in MS Windows' Standard Mode, programs utilizing high speed mode suspend operation when they are in the background. But unlike MS Windows standard mode, any other background programs running in DESQview/X's regular mode continue to multitask.

All MS Windows programs and nearly all DOS programs can be run in either regular or high speed mode. However DOS graphics programs, such as AutoCAD, can only be run in High Speed mode until custom drivers are developed for them.

More Powerful Than...

A speeding locomotive? You decide. We've already told you how fast DESQview/X is, and how easy it is to use. But DESQview/X has the power you need to make computing not just simpler but also more productive.

Let's begin with file management and the DESQview/X File Manager. File Manager lets you tag, cut, paste, delete and move any number of files at the same time.

With two directories (or drives) in view at the same time, finding and organizing your data has never been faster or easier.

Then let's not forget the fact that Adobe Type Manager™ and the 75 fonts (including 13 Adobe Postscript fonts) are included with DESQview/X. Don't settle for imitations or cheap substitutions. With DESQview/X you get the world standard, for the maximum in both quality and compatibility with your favorite software and printer.

Print Manager gives all of your programs background printing capability. Turn it on and forget it. Or don't! You can suspend, delete, or simply peruse your list of files queued for printing.

Manifest supplies memory "show and tell" so that anyone can see how their computer's memory is allocated. How much of what have you got? How much extended memory, how much expanded, how much high RAM? Exactly how much memory is available for each of your programs, and how much was used by the programs you already have loaded? Manifest even tells you what you can do to increase available memory.

System Monitor gives you instant insight into what's happening to your computer's CPU. Where are your computing resources going? Are some programs eating up your CPU time? System Monitor tells you what's going on, and gives you the power to eliminate programs that are abusing your computer.

More Fun Than...

A barrel of monkeys? Definitely! In addition to the Tetris™ and BlaqJaq games (and by the way, BlaqJaq is network compatible and Novell ready), DESQview/X also comes with a selection of icons and what jsut might be the world's greatest Icon Editor.

Not only does it allow you to make rectangular icons of any size and color(s), it can also be used to capture images that can be modified, if you wish, and then used as icons or as your desktop backdrop/wallpaper. Selecting background colors is fun, sure. But now that you have four or five programs on your screen, this makes it easy to quickly spot the one you are looking for.

And don't forget the free fonts that come bundled with DESQview/X. Fonts that give you lots of options for any of your graphics programs that access fonts. There are also three special Adobe fonts for your regular DOS programs. Because with Adobe Type Manager (also included with DESQview/X) you can display your DOS programs in scalable PC fonts.

Active Icons

One of the most exciting and useful features of the new DESQview/X is something we call Active Icons. With DESQview/X you can, through the magic of Adobe Type Manager, scale almost any program to the size that is most convenient and useful.

Surprisingly, many programs are perfectly usable even when reduced to one quarter or less of their normal size. Finding the best size is easy. All you do is grab a corner of a window and change the size. Tall and skinny? Short and wide? Postage stamp sized? In just a few seconds you can find the best size for you.

Reducing programs has an incredible impact on your productivity. All of a sudden your regular monitor can display as many as half a dozen fully functional full screen programs. Whether you want to compare spread sheets, cut and paste data between programs, watch real time data updates in the background (this is great for up-loading or down-loading over your modem), or just have instant point and click access to all of your programs, you will find that Active Icons will dramatically increase your productivity.

Active Icons are 100% active. You can type or mouse around inside any window at any size. Since Postscript fonts are infinitely scalable, so are your windows. All DOS text programs can be scaled.

DESQview/X

Up And Running With DESQview/X

When you first run DESQview/X you will find three program sets already set up for you: the Application Manager; Toolbox; and Fun & Games. From Application Manager you can directly select Help, start up a regular or scaled DOS window (more on scaled windows later), run the File Manager or open either Fun & Games or Toolbox.

In Fun & Games you'll find Tetris' (hey, forget about playing solitaire—we're talking fun here), our own special BlaqJaq, and some other surprises. In the Toolbox we've stashed some super utilities, like:

- **Print Manager**, lets you spool your print jobs to background process and gives you the ability to review, suspend or delete print jobs at will.
- **Adobe Type Manager**, where you can add, remove, select and review any of the 75 type faces included with DESQview/X.
- **Manifest**, for a complete analysis of exactly how and where your memory is being used.
- **Memory Status**, which gives you a quick look at how much memory is available on your machine at any given moment.
- And a **clock, point** and **click** access to DESQview/X setup, and more.

Have It Your Way

Freedom from choice? Not with DESQview/X. While some graphical interfaces (people) feel its their job to tell you what you need, what you want and what you can have, here at Quarterdeck we think that the best person to determine how your computer should work is, you.

DESQview/X gives you the tools to quickly, and easily, customize every part of the DESQview/X interface. Starting with the simplest things, like the size and dimensions of your icons, DESQview/X gives you more control over the look and feel of your system than any other interface in the world.

Do you prefer an icon driven or a menu driven system? Are you more comfortable with a mouse or with both hands on the keyboard? Do you want to hot key directly to applications or point and click? Or both? DESQview/X gives you these choices and puts you in control.

But beyond such basics as which way you choose to use DESQview/X is the radically new concept of letting you decide what the interface itself will be made up of. In just a few seconds you can change any part of the DESQview/X interface. Change the order of items on a menu, and put "Close" above "Open". Change the command keys you use to select an item. Change the name of menu items. Turn "Open" into "Select" or into "Choose" or anything else. Whatever you want to use.

Or go to the ultimate extreme. Delete every menu item and start from scratch. Put your name at the top. Title your menu "Steve's menu du jour," or "Sam's Excellent Computer," or anything you want. Add the menu items you want, in the order most useful to you, with the titles that make the most sense and the command keys that you like most.

This should take you about 20 minutes.

Developers: Cut Windows Development Time By 90%!!

Today developers have three choices when they decide to develop for a windowing environment: MS Windows, OS/2 and DESQview/X. Among these three, DESQview/X stands out for the unparalleled ease with which programs can be developed for or ported to the environment.

Porting from another X Window system is particularly fast and easy. One company actually ported over 100 MB of code in less than two months. This is even more remarkable when you realize that they were not just porting into DESQview/X, but they were also moving from the UNIX to the DOS platform.

In another case, a member of our sales force walked into a government agency to demonstrate DESQview/X. After the demonstration he watched while a couple of government technicians ported one of their in house Motif programs to DESQview/X. It took less than a single afternoon, and was completed before our salesperson left.

Developing for DESQview/X is also fast and easy. You will be amazed at how simple and direct the DESQview/X tool kit is, especially compared to the competition. Adapting existing DOS programs to DESQview/X in up to one tenth the time it takes to adapt them to either of our competitors, with no compromise in power or flexibility.

32 Bit Protected Mode Power, And More

DESQview/X delivers today the power and flexibility that competing environments only dream about. Stop waiting to put real 32 bit protected mode to work for you (of course 16 bit protected mode is still available, if you prefer). And our complete dynamic link libraries are just waiting for you, along with the complete Berkeley Socket interface.

The power of virtual memory, coupled with DESQview/X's preemptive multitasking and complete suite of interprocess communications abilities puts DESQview/X in a class by itself. And all of them are available today. Are you still waiting for these features?

A World-Wide Market

Perhaps more important than the ease and speed with which you can add windowing power to your software, is the size of the market you can reach. Remember, when you develop for DESQview/X you gain access to the entire universe of X Window computers. Any X Windows system running on any brand of UNIX or on DEC VMS can run your program developed for DESQview/X. With only the most trivial modifications, DESQview/X opens the world of RISC computing, SUN workstations, HP 9000, and an untold host of mini and mainframe computers world wide to your software.

Network inspiration: Realize the

FOR ten years everyone was waiting for, or proclaiming that, next year would be "the year of Networking." Now it's the 90's and, somehow, networks are here, everywhere. But even as networks have become ubiquitous, it seems that they have not brought the power and advantages we all thought they would provide.

DESQview/X Fulfills The Dream

DESQview/X will turn your network from a darkened room into a glittering palace. Every DESQview/X computer you have suddenly has the power of all of your computers.

How? Through the power of remote computing and shared resources you are no longer limited to the size of your hard disk, the speed of your CPU or the size of your memory. With DESQview/X you gain the ability to reach out to any other computer, or computers, on your network and harness their resources to meet your needs.

The Power of Remote Computing

With remote computing you can start and run programs on any DESQview/X computer on your network from your keyboard. It shows up on your screen, in a window than you can zoom, or size, or move, just as if it were actually running on your computer. But it's not.

By sharing the computing resources of the entire network, critical applications and projects are only constrained by the fastest computer on the network, regardless of whether your computer is a 286 lap-top or only has two MB of RAM. With remote computing there is no load on the memory or CPU of your computer. Think of it as pure power.

You can even include remote programs in your suite of start-up applications. Double click on an icon or select from a menu. No matter how you reach out and activate the power of another computer, it is as easy and transparent as running something locally.

A Synergized File Manager

Remember File Manager, our point and click solution to hard disk management? You know, the one that lets you copy, move, tag, delete, (etc.) the files from two different drives or directories at the same time? The one that comes standard with every copy of DESQview/X.

Well, we didn't tell you the whole truth when we first described it to you. Yeah, we were holding back the fact that File Manager works just as well on networked drives as it does on your own drives. So you can review, copy, arrange, etc. all the files you need, no matter what networked computer they reside on.

Don't Get Paranoid

We wouldn't put the power of DESQview/X in just anybody's hands. Included in DESQview/X is a complete security system. Before anyone can access your computer, you have to say "Yes!" You have full control over the people, the data and the applications that will be shared.

System Monitor also has hidden network talents. When it reports what system resources are being utilized, it also tells you who is utilizing them. You can tap into the program for a complete run down of what it is and what it is doing. You can even view the program on your screen as it executes.

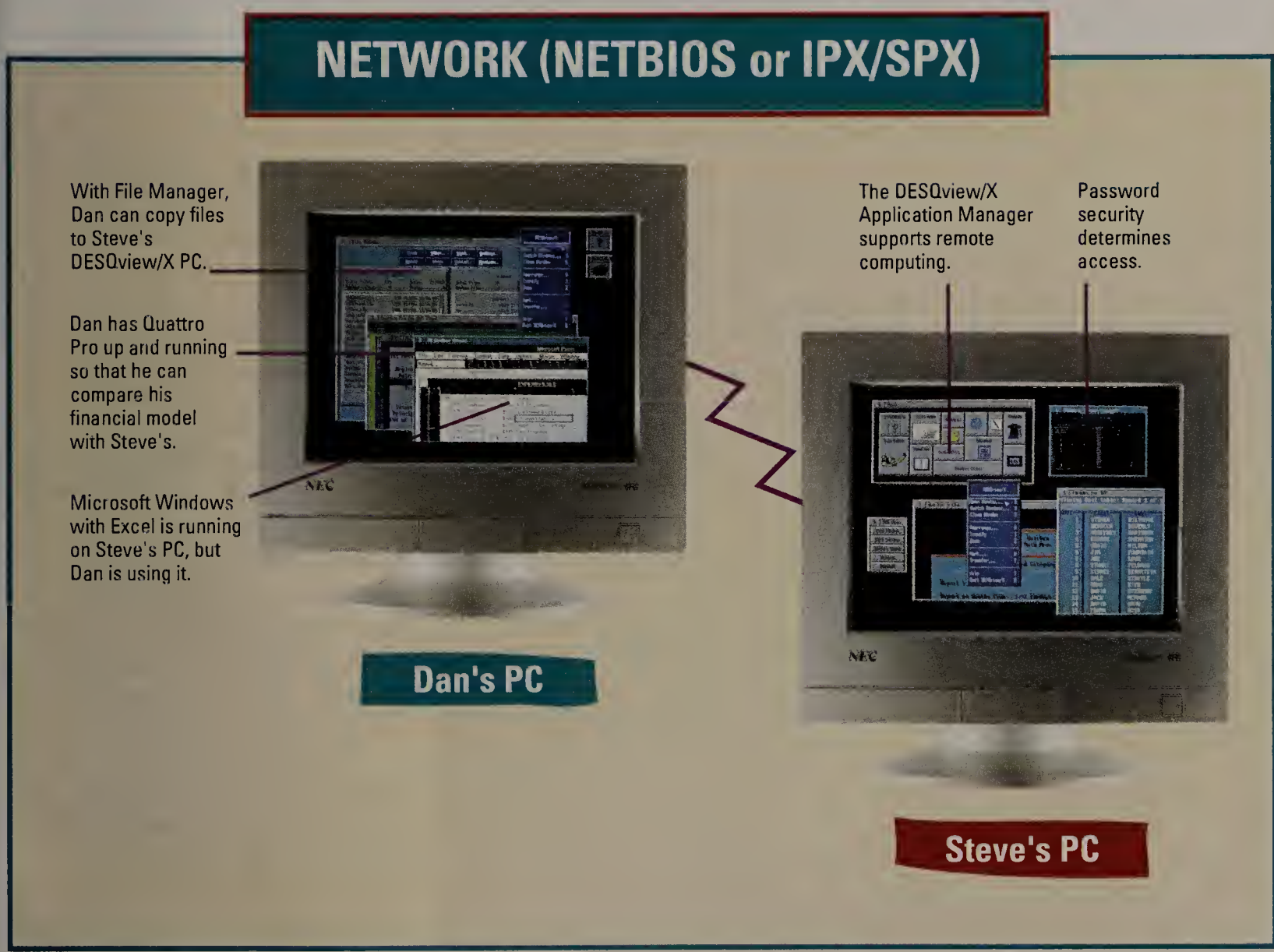
Is your system slow because of that big database sort you are running in background, or did Mike slip a big spreadsheet recalc into your computer without saying 'Please?' If he did you can 'nuke' him (but you might want to give him a call first to warn him).

An Administrator's Paradise

DESQview/X is also a dream come true for network administrators and support managers. To begin with, you can diagnose and repair problems remotely. After all, there is no reason why the programs that you run remotely can't be diagnostic programs, is there!

Start with one of the most valuable diagnostics around, Manifest. After all, it comes free with your

dreams of two decades



copy of DESQview/X. Run it remotely on any DESQview/X computer on your network to quickly scan Config.sys and Autoexec.bat files, DOS version, network drives loaded, and memory usage/conflicts.

But don't stop there. Run Edlin or your favorite editor to make changes in real time. Right from your desk. Talk on the phone while you solve the problem, have the user reboot and verify that his problem is solved. Right from your desk. Are we having fun now?

Support Central

What about configuring and installing software? What about upgrades and updates and bug fixes. You can do it all from your desk with DESQview/X and the DESQview/X File Manager.

Run install.bat for any program without getting out of your chair. Change program defaults, set data paths and distribute new releases from your own keyboard. Not to mention the ability to monitor just what software is actually in use, and make sure that your company has the licenses it needs to stay on the right side of the law.

Training For The Future

Don't forget about training. Remember the view feature of System Monitor discussed earlier? Think of the implications this has for training! One on one, you can view what a user is doing—or trying to do. At the same time, in another window, he can watch while you show him the way it should be done.

In fact, you can broadcast to four, five or even six DESQview/X computers at the same time. Give classes to an entire department at once. Everyone watches as you take them through the steps of installing a new program or learning how to use an old one. Monitor their progress without burdening your CPU or wasting any of your precious RAM.

Your Standard Solution

The DESQview/X interface is infinitely customizable (see box "Have It Your Way" in previous

Go To VAR Heaven

Old VARs don't die, they just become Systems Integrators.

If you are a VAR or Systems Integrator you'll think you have died and gone to heaven when you discover what DESQview/X can do for you.

With DESQview/X you can create fully customized menus and dialog boxes for every part of the DESQview/X interface. Customize the title bar of the main menu, where you can display your name, your customer's name or the name of the software solution you are installing. Standardize the menus for all applications you install with application specific sub menus. Give your installations a unique look and feel with specifically sized, shaped and colored icons.

Choose from simple point and click interfaces or easy to access keyboard based menuing systems. With DESQview/X you have the tools you need to create solutions that sell. Elegant, easy to use menus can be created in minutes. In no time at all you have a look and feel that is unique to your company and the solutions that you are selling. How's that for a competitive advantage?

Once you have developed your own suite of menus and icons you can save, transfer and install them on an unlimited number of computers in seconds. And the time it takes you to develop them will be counted in minutes. A complete custom environment can be done in as little as two hours!

And with DESQview/X's comprehensive support for both text and graphics based DOS programs and MS Windows, you can be sure that it is going to be compatible with the solutions you sell.

It's like having an in-house development team on your payroll for the price of off-the-shelf software.

section). Equally important is the fact that the custom look and feel you create can be quickly and easily propagated across an entire network in just minutes.

From a set of custom icons, to department or company specific menus, propagating standards is as easy as selecting 'copy' in File Manager. Discrete files define the nature and composition of every menu. You can literally point and click your way to a company-wide interface.

Work Groups: The Wave Of The Future

Today, everyone is talking about work groups the way they used to talk about networks. Well it's time to stop talking and start doing something about it.

With DESQview/X you can tap into the power of work group computing today, with the software you already use. All of the DESQview/X functions described above apply to remotely processing programs as well as local ones. Cut and paste between your Lotus 123 spreadsheet and Mary's Quattro Pro based budget. You and Mary both watch the results as your spreadsheet re-calculates.

Monitor the report that Richard is typing up in Word Perfect and call him on the phone with a clarification or sudden brain-storm. Hold a real time meeting with six people on the network where you all see the same spreadsheet at the same time. If your network can handle it, DESQview/X can deliver it.

DESQview/X delivers today the network power you've been waiting for, and dreaming of. For DOS and for MS Windows. Don't settle for promises and press releases when you can have the real thing.

Quarterdeck, the technology leader in multitasking and windowing for ten years. Bet on a winner.

DOS and UNIX synergy

BY now you probably realize that DESQview/X is astonishingly more powerful and more flexible than any other windowing system in the world. But many people will feel that we have saved the best and most amazing side of DESQview/X for last.

Amazing, Incredible, Impossible,... But True

What else can DESQview/X possibly offer? How about this: with DESQview/X you can tap into not only the computing power, memory and disk space of any other networked DOS machine running DESQview/X, you can also access the power of any networked UNIX or DEC VMS X Window system.

Just add our Network Manager for TCP/IP and Novell's Lan Workplace (or FTP's PCTPC) and you can put the power of a SUN SPARCstation on your DOS computer. You can upgrade an entire Novell network simply by adding a couple of RISC workstations. You can utilize divisional or corporate mainframes and minicomputers from your desktop.

And if you already have UNIX and PC networks running side by side you can link them together and multiply the power of each network almost infinitely. Because there's one more thing about DESQview/X that you have to know.

Complete Integration

With DESQview/X your X Windows computers and workstations also gain complete and transparent access to the world of DOS.

Run Lotus 123, dBase IV, Pagemaker or any other MS Windows or DOS text program from a DEC Vaxstation or IBM RS 6000 workstation. Standardize on any collection of DOS and UNIX programs throughout your division or company. Select the application that best meets your needs, without regard to what operating system it requires.

Just Point And Click

That's right. Run any program on any computer just by double clicking on the appropriate icon. In fact, there is no reason for a user to ever know whether the program he is running is executing locally or remotely, in DOS or in UNIX.

No matter what the situation, regardless of the combination of programs that are running, everything appears as if it were just another program. Cut and paste text data freely. Scale windows and compare data from different programs side by side in real time.

If you are customizing your menus, adding UNIX programs is no different than adding any local or remote application. Of course when running any remote program you must indicate where the program is and what computer you want it to execute on. Once it is set up and assigned an icon or a hot key combination you never have to worry about it again.

Share The Power

Use File Manager to transfer data between operating environments. In fact, File Manager is so powerful that many UNIX users may come to rely on it even when performing entirely UNIX file manipulations.

File Manager is also a quick way to give everyone easy access to any remote application. Once you have constructed an icon for running a remote program you can copy this icon to any other DESQview/X computer on the network. In seconds, everyone can share the power of a remote mini or X Window workstation.

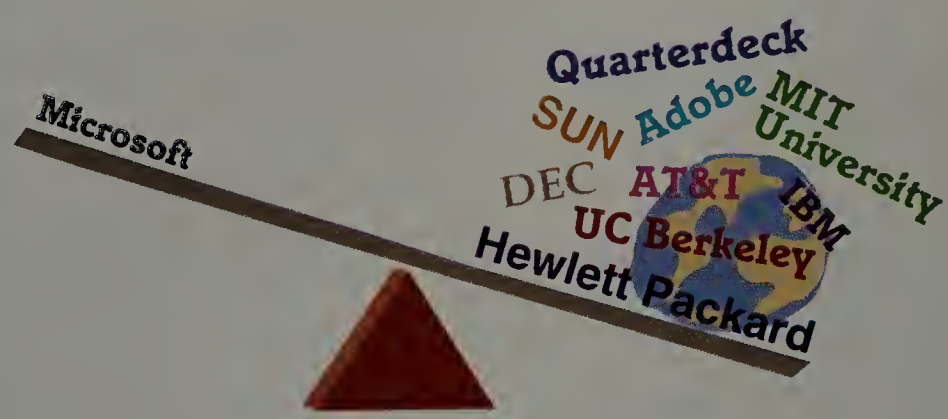
Corporate Standards: OSF/Motif & OPEN LOOK

DESQview/X also goes a long way toward supporting your existing company standards. Choose between the standard Quarterdeck X Windows interface that comes with DESQview/X, or

Desqview/X OSF/Motif

Desqview/X OPEN LOOK

The Power Of One VS The Power Of Many



Who are you going to bet on?

If you listen to some people it sounds like the future holds a single answer. I guess it all depends on who you listen to. One thing's for sure, some people will make a lot of money if they're the only game in town. But do you really believe that any one company could really have all of the answers?!

Here at Quarterdeck we've built our company around two principles. First, it is our goal to bring increased computing power to the users of DOS computers. From our best selling memory products like Quarterdeck Expanded Memory Manager-386 (QEMM) and QRAM, to our powerful DOS multitasking programs DESQview and DESQview-386 (detailed in the following sections), to our newest graphical environment breakthrough: DESQview/X, Quarterdeck products put more computing power in your hands.

Second, we believe in the power of standards. Just as we support the DOS standard, DESQview/X is built on the international X Windows standard.

When you invest in DESQview/X you put the world's best minds to work on your computing needs. Every six months new extensions to the X Windows environment are released. And because X is an open standard, the new releases are all free.

From MIT to the legendary Bell Labs, computer scientists are putting together the multi-media, the networking, the voice recognition and the 3-D graphics solutions of the future. Domestically and internationally, businesses and universities combine their efforts to produce the most powerful, reliable and extensible systems in the world.

When you build on DESQview/X, as an individual user, as a company, or as a developer, you are supported by this world-wide X Windows community. X Windows advances are your advances. And every X Windows system is your oyster.

add one (or both) of the optional interfaces: OSF/Motif and OPEN LOOK.

With either optional interface your DESQview/X equipped DOS computers will not only have access to UNIX host computers, but they will have the identical menus, icons and complete look and feel. You even get all the interface specific customization tools you that are familiar with. This can save substantial amounts of training (or re-training) time for your company.

Keep in mind, though, that no one squeezes as much power out of your computers as Quarterdeck. Allow an extra 300K of RAM to run OPEN LOOK, and an extra 800K for OSF/Motif. Also, neither of these interfaces have the powerful mark and transfer, customiztion or keyboard macro features of our DESQview/X interface.

DESQview/X Is The Future

From DOS to UNIX. Run any DOS, MS Windows or X Windows program. Access DOS and MS Windows from a SPARCstation, or run the powerful Interleaf typesetting system on your 386. Utilize the full power of all of your computing resources, and discover the enormous untapped power of your PC and TCP/IP networks.

With DESQview/X your future is only limited by the size of your dreams and the reach of your imagination.

A Warning to Systems Integrators

You'll never have a competitive edge if you always run with the herd.

The future is clear, graphical interfaces are here to stay. In fact, you can throw away all of your DOS, MVS, UNIX and any other kind of software that you own or sell because there's only going to be one platform and one kind of software in the future. Right?

Breakfast is Being Served (and you can have the competition for lunch)

VARS and System Integrators are invited to join us in Los Angeles, New York, Toronto and London for breakfast. See for yourself how DESQview/X will leverage additional sales into your existing client base, at the same time that it gives you a big edge in winning new clients and contracts.

Call us for times and dates: (310) 392-9851

If convincing your clients that spending hundred (or thousands) of dollars replacing software, retraining employees and supporting MS Windows doesn't sound like a winning strategy to you, we'd like to offer you an alternative.

DESQview/X gives you have the tools to supply elegant and uncompromising enterprise solutions to your clients. The built in support for PC LANs—Novell Netware or Netware Lite, or any NetBIOS supported network, such as LAN Manager or Banyan—means that you can enhance or upgrade the power of nearly any customers network instantly. And the interoperability provided when you add the Network Manager for TCP/IP is truly extraordinary. Link your customers DOS and UNIX networks together for the first time. Deliver the best DOS solutions to IBM, Sun and HP workstations, at the same time that you reveal the unparalleled power of RISC based UNIX applications to ordinary PCs running DOS.

DESQview/X brings you the windowing, pre-emptive multitasking, DOS and MS Windows compatibility, memory management, data transfer, and keystroke macro capabilities that you need. Today, not some day.

Add to this X Window System graphics, Adobe Type Manager, a graphic desktop, customized menus and icons, distributed computing, and a built in 16 and 32 bit shared DOS extender with dynamic link libraries and virtual memory.

API Conference

Seats have been going fast for Quarterdeck's annual developer's conference ever since it was announced that attendees who sign up before August 15th will receive free DESQview/X developer toolkits. Call us for details.

The result is power unmatched anywhere today.

VAR and SI Special
Buy 4 Get 1 Free!

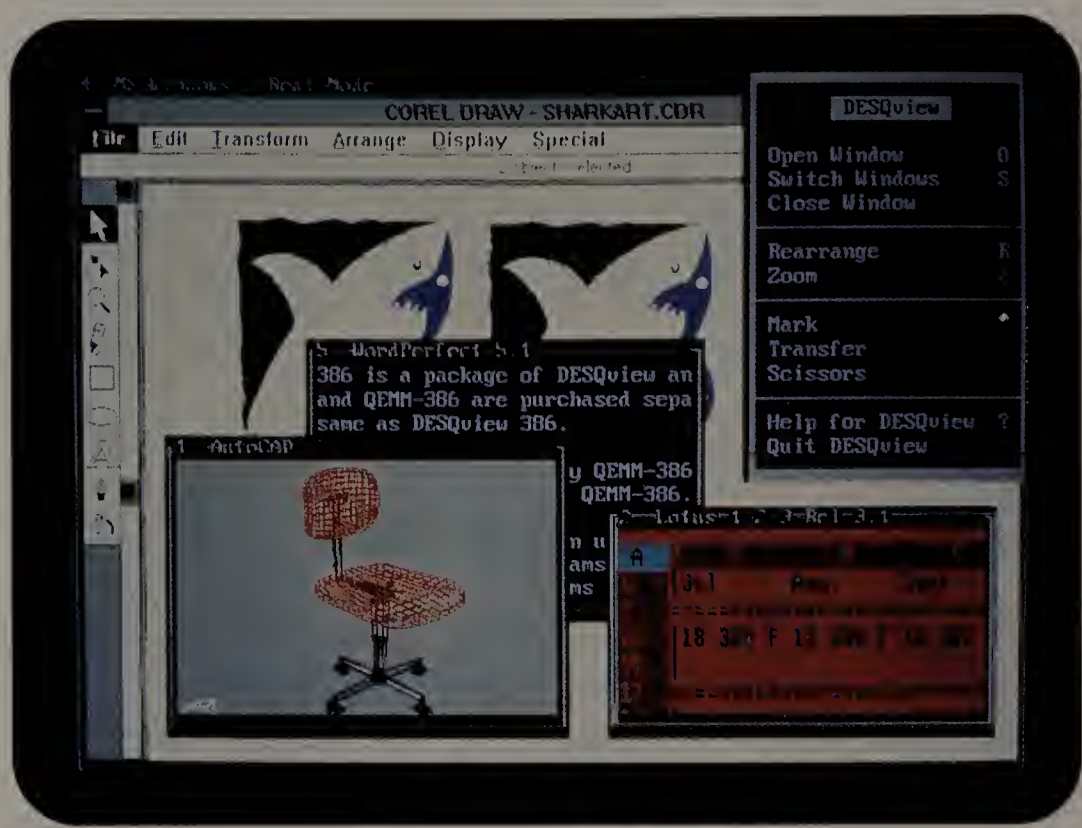
Buy four copies of DESQview/X from your favorite distributor. Send us your paid invoice and get an additional copy free—direct from Quarterdeck. Call us for the complete, no-hassle, details.

Take advantage of what DESQview/X has to offer, before the competition does. While the other guys are trying to explain that some day they will have powerful networking and cross platform solutions you can be selling and installing your own. Customized to look and feel exactly the way you, and your client, want. Supporting all the best applications in the world: DOS based, UNIX based, and even MS Windows. Platform independently. Stop waiting, the future is here.

Advertising

DESQview: State of the Art

Bringing the Power of DOS Windowing and



You don't need 4 MBs of memory or a 386 computer to multitask your software in windows—all you need is DESQview!

YOU want more power and performance from your computer. You've heard about MS Windows and the great features it provides. You want to run multiple programs in windows at the same time, move data easily between programs, get on line (and context sensitive) help when you need it, and make your computer easier to use. Wait a minute—you just described DESQview.

Shocking But True

This may come as a shock, but the programming techniques first developed by Quarterdeck nearly 10 years ago for DESQview, are essentially the same ones only recently adopted by competing windowing environments.

You Can't Touch It

Now that you know that, it should come as no surprise that after 10 years of experience we've got a few tricks that MS Windows can't touch. We bring the power and performance of windowing and multitasking to 8088, 8086 and 80286 computers. Full features. No compromises. Run Lotus 123 and WordPerfect side by side. And Paradox, or your favorite xBase program. And Pagemaker. That's right, with DESQview you can run both DOS and MS Windows programs at the same time, side by side (along with GEM and GEOS too, if you want). On any computer with EMS 4 memory, even an 8088.

Bigger Isn't Always Better

Have you ever wondered why every release of MS Windows is bigger than the last? Or why MS Windows 3.x isn't compatible with MS Windows 2.x which wasn't compatible with MS Windows 1.x? We sure have. It makes you wonder about MS Windows 4.x and MS Windows NT, doesn't it. While MS Windows has been getting bigger, DESQview has been getting better. Compared to the bloated 10 to 15 MB of space required by MS Windows 3.x, DESQview is positively gem sized: less than 400K.

Technology

Multitasking to 8088, 8086 and 80286 Computers

More Than You Bargained For

DESQview may be small in size, but it's big in features. Not only does DESQview deliver the multitasking muscle and superior speed that you need to increase your computing productivity, it also contains vital enhancements that MS Windows hasn't even dreamed of. Things like keyboard macros that can either be global, or that can be automatically customized for every application you run, auto dialing of phone numbers from within almost any program, and pop-up menus that are just as easy to access from your keyboard as they are with a mouse.

Supposedly new features touted by MS Windows 3.1, such as on the fly performance tuning, hot keying directly to applications, or auto start-up of any selected group of programs when you turn on your computer, have been available in DESQview for years.

Faster Is Better

In need of speed? DESQview delivers. In fact, PC Week tests revealed an amazing fact: DESQview multitasks DOS and MS Windows programs, like Excel, faster on an ordinary 80286 than MS Windows can do it on a 25 mhz 386! In addition, DESQview will let you run twice as many programs at the same time in any given amount of memory (1, 2, 4 or 8 MBs).

No Hassles

DESQview auto loads quickly and easily from a single disk. No complicated or confusing setup. DESQview searches your hard disk for applications and builds a customized menu that gives you instant access to your programs.

Power and Performance: Elegantly, Inexpensively

Flexibility and Savings. In case you missed the point: you don't have to buy new hardware or software to put the power of DESQview to work for you. DESQview works with the equipment and the programs that you already own, at the same time that it gives you access to the newest, most powerful technological advances. Run any program in just four keystrokes. Move from one program to the next with just a click of the keyboard or mouse. Zoom programs to full screen with a simple 'Alt-Z.' Cut and paste text between programs instantly. You'll see productivity gains immediately, and you will measure your learning curve in minutes, not in weeks or months.

A Portable Solution

If you have a portable computer you will really enjoy the superior technology that makes DESQview lap top friendly. The smaller size means more room on your hard disk. The faster speed means you don't have to trade in your hardware for superior performance. And the fact that DESQview will run twice the number of programs that MS Windows can in any given amount of memory will maximize your performance on the road. And the ease with which you can use DESQview straight from your keyboard and without a mouse is sure to put a smile on your face.

The Power Of Superior Technology

Think about it. DESQview is faster. DESQview is more powerful and more efficient. DESQview multitasks your programs and lets you run your choice of DOS, MS Windows, GEM or GEOS programs—side by side, using your keyboard or a mouse. Does this mean that a lap top 80286 with DESQview actually delivers more computing power than a full sized 386 with MS Windows?

In a word: **Yes.**

DESQview: The First. The Best.

Network Ready, Network Friendly

DESQview sets the standard for network support. As you might well expect given the amazing network power of DESQview/X, DESQview has extensive network abilities built in. From the first time your software reaches out to connect to a remote server, you will find that DESQview makes networking the simple, seamless experience that you dreamed it could be.

Whether you are connecting to a network file server, using 3270 emulation or accessing a remote host through a gateway—or even if you need to do all of these at the same time—DESQview delivers the reliable background processing and powerful multitasking capabilities you need for mission critical applications.

Stop Suffering

If you're suffering with MS Windows on a network, DESQview is heaven sent. By multitasking your MS Windows applications inside of DESQview you can not only improve your performance but you can eliminate those frustrating network problems that just don't seem to go away.

Customized Solutions

Included in DESQview is a powerful Application Program Interface (API), that programmers can use to create multitasking programs and workstations. Using the API mailboxes, interprocess communications, shared programs and menu-building, DOS programs can gain MS Windows or OS/2-like power with a small fraction of the time and effort.

Currently Available

API tool kits for: C, xBase, APL, Clipper, Basic, and more!

Desqview-386: All Gain, No Pain

UNLEASH the power of your computer! Combine the power of DESQview with the power of Quarterdeck's Expanded Memory Manager-386 and you have DESQview-386. You also have a multitasking and windowing environment that puts MS Windows to shame.

If a 286 running DESQview is faster (even when multitasking MS Windows applications —see 'Faster Is Better' on previous pages), more flexible, and more powerful than MS Windows running on a 25 mhz 386, what happens when you add DESQview-386 to a 386 or 486 computer?!

Power Miser

Start with the basics: a 386SX running at 16 mhz and 2MB of RAM. In most companies this is the work horse of today, and tomorrow. With MS Windows this configuration lets you run one MS Windows application, like Excel, and that's it. So much for multitasking.

With DESQview-386 this same computer can switch instantly between three, four or even five different programs all running at the same time, each in its own window. No need for more memory, a bigger hard disk, or a faster CPU. You can even run MS Windows and Microsoft Excel in one DESQview window and still have plenty of room for other applications. Add Word Perfect and Paradox and cc:Mail. Or your choice of any DOS, MS Windows, GEM or GEOS programs.

More Performance, Not More Hype

MS Windows is fine if you've got memory, mips and money to burn. But why turn your 386 into a 286? Or your 486 into a 386? Why start all over again with a new spreadsheet, a new word processor and a new database?

The more horse power your computer has, the more performance DESQview-386 delivers. DESQview-386 enhances your productivity without extracting a huge penalty in computing power. With DESQview-386 you save time and money. You get the maximum out of the hardware and software that you already own.

Billions and Billions

Ok, this is an exaggeration. But it is no exaggeration to say that DESQview and DESQview-386 are used by millions of people in tens of thousands of companies all over the world.

Where is DESQview-386 used?

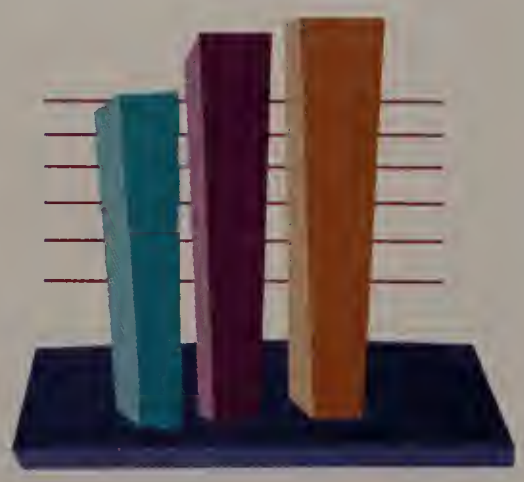
The best place to use DESQview-386 is everywhere. Here at Quarterdeck a 386 SX with 4 MBs of memory has become our base machine. With it we can run two or three large programs and another four to six smaller applications. Here's what we do:

To begin with, everyone has continual access to four basic company wide (world-wide) applications: cc:Mail; Fones, which contains name, title, extension, location and department information for the company, updated daily; QVL, an in-house database of random information such as pricing, product reviews, release and version notes, etc.; and Q-FAX, a program for sending out faxes over our bank of networked fax machines.

■ In Finance

How do you increase the productivity of your finance department? By removing barriers that keep them from getting the information they need, and by giving them the tools to efficiently analyze the information they have.

With DESQview our analysts have instant access to network based reports and information in the Expandable (Dataflex based)



Standard Features

Multitask DOS, MS Windows, GEM and GEOS side by side

Easy mouse and keyboard access to all commands

Run programs in re-sizable windows

Fully automatic installation

On line context sensitive help

Default start-up and auto loading of programs each time you start DESQview

Hot key to applications

Point and click file management

Bullet proof network support (both IPX/SPX and NETBIOS)

Cut and paste text data between any programs, with keyboard or mouse

API tool kit available to customize interface

Full keyboard macros specific to each program you run

Auto-dial phone numbers from within programs

Error isolation for application specific errors

Increased memory for all applications

Automatic memory management: extended/expanded/High RAM

Built in screen-saver

Tag, Copy, Move, Erase files at will

Display the contents of two, three, four or more directories at the same time

Easily add or remove programs and utilities from your menus

Full font and graphics support for graphics programs, even when running in background

Just two mouse clicks or four key strokes loads and runs any program

Run lots of programs without adding RAM to your 386 or 486

Format floppies in background while you work

Zoom any application to full screen or return it to a sized window quickly and easily with 'Alt-z'

Just double click on the Alt key to switch between loaded applications

If some of these sound new to you they shouldn't, DESQview has had them for years.

accounting system and in our EmeraldBay (xBase) order processing system. Working in the accounting system they find the necessary data, and then cut and paste that data directly into their spreadsheet (Lotus or Quattro Pro), a database (usually Paradox) or word processor (Word Perfect). Reports can be generated on line and then immediately imported for further analysis.

The time saved and the increase in productivity is so great that it is literally impossible to measure. Running four to six programs at any one time gives our analysts finger tip access to the information they need and the tools they need to make use of it.

Yet all this is done with the same off the shelf programs used by most companies: Lotus, WordPerfect, Paradox, EmeraldBay/xBase, etc. No special software—except for DESQview, and no additional investment in hardware was required.

■ In Accounting

In the accounting department you see essentially the same situation as in the finance department, but with an inverted emphasis. Our financial analysts want to take information from the Expandable and EmeraldBay in order to produce budgets, presentations, etc.

Our accounting personnel spend less time using spreadsheets and more time cutting checks, entering invoices and posting journal entries. They use the same basic suite of programs with a different concentration effort. In accounting the spreadsheet is the "supporting software" that makes them more productive.

Reconciling an account is a snap when the data can be instantly captured by a spreadsheet for review. A purchase order can easily be electronically mailed to a department for explanation, backup or clarification. Discrepancies between sales and accounting can be tracked down and repaired in real time more easily, when both systems are running side by side on the same screen.

In addition, credit card information can be instantly processed by having InFact (from Modular Data) process the charges in

background. Using DESQview scripts (keyboard macros) to automate the cutting and pasting between EmeraldBay and InFact reduces the entire verification process to only a couple of keystrokes.

In Sales

Is it possible for a company with sales of over $40,000,000 to have less than twelve people in its sales department? It is if you give them the tools they need to make them truly productive.

Combine a regular telephone with ACT (network version), Word Perfect, cc:Mail, a data base (sales uses Alpha, Paradox and EmeraldBay) and a spreadsheet—all working together, at the same time—and just watch what happens.

Letter based sales campaigns pour out for every trade show and every promotion. Customers receive faxes almost instantly (Q-Fax allows us to initiate faxes without leaving our desks, often while they are still on the phone with a dealer or customer). Sales and profit rates by region and by campaign are more easily tracked and analyzed.

Beyond that there are the intangible but very real benefits of having current pricing, version information, and supporting sales materials (all in QVL, mentioned above) instantly available.

And remember, all this is being done on an ordinary 386 SX with just 4 MB of RAM with a street price of about $1,000, and the same DOS software that you probably are already using in your office today.

In Tech Support

Our technical support department turns out to be one of the heaviest computing users in the company. To begin with they run two major network applications: our customer database, which is maintained in EmeraldBay; and Previews, from Folio Corporation.

These two programs alone double the productivity of each of our people. The customer data base allows every technician to add, update and delete users, verify serial numbers and prompt for upgrade sales when a customer has an older version of our products. Previews forms the backbone of the department, as the central repository of all technical problems and solutions.

Of course they also run a copy of Manifest for reference use during calls; Q-Edit, Word Perfect, or Microsoft Word for taking notes; and a call timer. Tech support is probably the heaviest user of Q-Fax. With twenty or thirty 'tech notes' dissecting standard problems, long support calls can often be cut short by the instant, on line use of Q-Fax.

Beyond this, many of our techs are aspiring programmers. It is not at all unusual to find one them compiling a program in background while they are taking calls and using the customer database and Previews in the foreground. In addition, our designated electronic bulletin monitors run Recon (or an equivalent) to handle Compuserve, Genie, et. al.

But we have to confess, many of these people actually require 5 MB of RAM on their 386 SX!

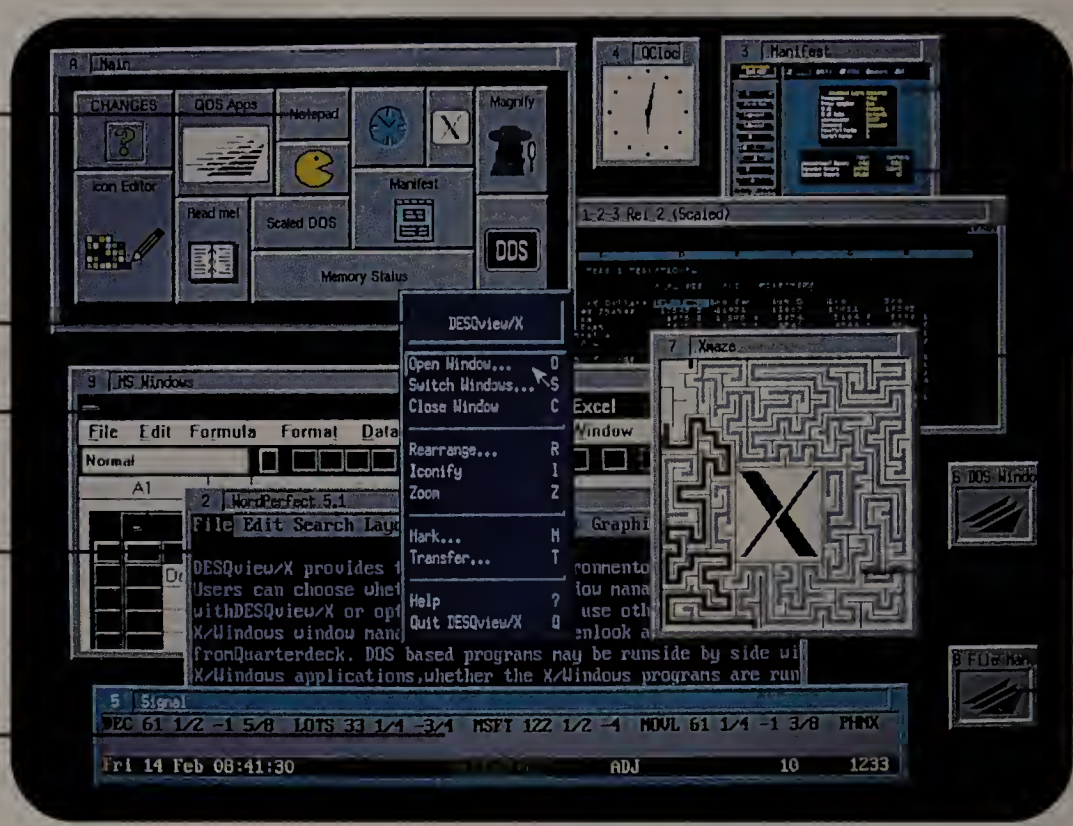
Raising DOS to the Power of X™

DESQview/X Application Manager, for organizing programs and projects

Comfortable DESQview look and feel for BOTH keyboard and mouse users

DOS and Windows applications compatibility

Multitasking



Award winning memory management with Manifest and QEMM-386

Scalable fonts and scalable DOS windows thanks to Adobe Type Manager™ for DESQview/X

Built-in X Window System graphics, the international standard for graphical windowing and distributed computing

DESQview/X File Manager for managing files on your PC and on remote systems

DESQview/X takes your 386 or i486 computer where it has never gone before. Beyond mere windowing, beyond ordinary graphical interfaces. With DESQview/X your computer is no longer limited to the power of your PC and DOS applications.

DESQview/X brings you the windowing, multitasking, DOS and Microsoft Windows compatibility, data transfer, and key-stroke macro facilities, that you would expect from Quarterdeck, the leader in DOS multitasking. With the addition of X Window System graphics, Adobe Type Manager™ for scalable fonts and scalable DOS windows, a graphic desktop, customized menus and icons, and remote computing, DESQview/X redefines the limits of personal computing.

Technical Support: 310/392-9701 Fax: 310/314-3217

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LABEL *and* ENVELOPE PRINTERS

BY DAN MILLER

Have you been keeping that old Selectric around just to address envelopes? Here's how to bring labeling into the computer age.

When it comes to addressing envelopes, labeling file folders, and performing other specialized print jobs, you're probably still using your office's trusty old typewriter—or even your favorite pen. Doing any of these on the computer always seems like too much trouble: Formatting the addresses requires commands intended for desktop publishers, and when you try to print them on your regular printer, you just pray that some errant label won't apply itself to the printer's innards or that a co-worker won't print a spreadsheet on your envelope.

No wonder you've been reluctant to toss that typewriter. But now, thanks to specialized printers and software enhancements to programs you already use, you have some alternatives.

LABEL PRINTERS

If you produce lots of individual letters and need to address envelopes one at a time, you might consider buying a *label printer.* These small machines sit unobtrusively on the desk, always ready to spit out a label for an envelope, a file folder, a binder, or a disk.

Label printers are shipped with their own software—TSRs or stand-alone programs that can grab or import addresses from your favorite applications and then format them for output. These machines are about the same price as a cheap dot matrix printer, and each label costs about 5 cents. Their big drawbacks: They can't print anything but labels, and they're not much help when preparing high-volume mailings.

LINDA BLECK

ENVELOPE PRINTERS

If you want to print on media that a label printer can't handle, or to share addressing capabilities over a network, check out one of CoStar's *envelope printers.*

Unlike their smaller cousins, these machines print on envelopes, rolodex and index cards, and other odd media, as well as on labels. You can attach CoStar's Address Express and AddressWriter to your network. On the downside, envelope printers are significantly larger and more expensive than label printers.

USING YOUR EXISTING HARDWARE

If you don't want to buy a printer just for labels and envelopes, you can always use the printer you already own.

For mass mailings, nothing beats a dot matrix. Dot matrix labels come in continuous-form sheets, so you can print thousands at a time; if you're using an off-site agency for a mass mailing, it will usually require such labels. Because of their relatively crude paper handling, however, dot matrixes aren't so good for envelopes.

Lasers, by contrast, are great for envelopes. The most convenient setup is a laser with an envelope feeder installed as the second tray; a single, adjustable paper tray is the second-best option, and a manual feeder's the most trouble. Lasers can do labels, too, particularly for small to medium-size mailings when print qual-

ity counts. If your laser has face-up output, labels will follow a straight path through the printer—the best defense against labels "predispensing" inside the printer. If you're using your laser for labels (or if you're printing addresses onto plain paper and then copying them onto labels), be sure to use special laser labels with heat-resistant adhesive.

SOFTWARE SOLUTIONS

If you use your existing hardware to print labels or envelopes, you can also use your existing software to prepare addresses for output.

With older word processors, formatting labels and envelopes was laborious. Many newer versions, such as *Word for Windows 2.0*, *WordPerfect 5.1*, and *Ami Pro 2.0* come equipped with icon buttons, macros, and templates so you can print envelopes and labels with just a couple keystrokes.

Most popular data base managers give you labeling utilities as menu items, but for envelopes, you may want to import data base addresses into an envelope-friendly word processor. Data base programs have the advantage of letting you select and sort records; some can print bar codes, and a few can even calculate them from ZIP codes, which can mean major savings on mass mailing postage.

For printing one label at a time, TSRs will do the job.

If your software can't print labels or envelopes conveniently, you may want a specialized labeling program.

For printing one label at a time, you can find TSRs that will grab addresses from whatever application you're running and format them for printing. If, on the other hand, you want to print batches of labels, look for a stand-alone program that can import and

LABELING SOFTWARE

Manufacturer	Product	List price	Windows product	TSR/stand-alone mode	RAM required in TSR mode (K)	Imports from DBF/ASCII files
AVERY DENNISON	Label Pro 1.6 [1]	$99.95	N	N/Y	n/a	Y/Y
BLOC PUBLISHING	Fast Pak Mail	$99	N	N/Y	n/a	Y/Y
COSTAR	AddressWriter	n/a [3]	N [4]	Y/N	44	Y/Y
	Address Express	n/a [3]	N [4]	Y/N	44	Y/Y
	LabelWriter II/II Plus	n/a [3]	N [4]	Y/N	44	Y/Y
DACEASY	Rolodex Live	$49.95	N	Y/Y	7	Y/Y
DATA CONSULTING	Data-Easy PC Ultimate Mailer	$125 [5]	N	N/Y	n/a	N/Y
E.R.M. ASSOCIATES	ERMAsoft Laser Envelopes	$59.95	N	Y/Y	8	Y/Y
NOR SOFTWARE	Labels and Forms	$89	N	N/Y	n/a	N/N
POWER UP	Labels Unlimited	$89.95	N	N/Y	n/a	N/Y
REINIUS SOFTWARE	LaserBase	$50	N	N/Y	n/a	Y/N
SEIKO INSTRUMENTS USA	Smart Label Printer Plus	n/a [3]	Y	Y/Y	8	Y/Y
USEFUL SOFTWARE	Books, Cards, and Labels	$99.95	Y	N/Y	n/a	Y/Y
ZPAY PAYROLL SYSTEMS	Grab Plus/WinGrab	$49.95	Y	Y/Y	6	N/Y

[1] Bundled with Avery printers.
[2] Separate versions for dot matrix and laser printers.
[3] Available only with manufacturer's label or envelope printer.
[4] Windows version expected to ship in third quarter.
[5] Single-user version; multiuser version $250.
[6] Envelopes only.

PRINTERS

Manufacturer	Product	List price	Dimensions (inches)	Weight (pounds)	Printing method	Feed	Maximum label width (inches)
LABEL PRINTERS							
AVERY DENNISON	Personal Label Printer	$279	6.3 x 3.9 x 7.8	1.3	thermal	friction	3.5
COSTAR	LabelWriter II	$249.95	4.5 x 6.5 x 7	1.25	thermal	friction	3.5
	LabelWriter II Plus	$369	4.5 x 6.5 x 7	1.25	thermal	friction	4
SEIKO INSTRUMENTS USA	Smart Label Printer Plus	$199.95 [1]	6.1 x 3.6 x 6.3	1	thermal	friction	3.5
ENVELOPE PRINTERS							
COSTAR	Address Express [2]	$795	16 x 16 x 8	14	ink jet	gravitational	10.25
	AddressWriter	$595	8.7 x 8.5 x 8	9	dot matrix	friction/pin feed	5.3

[1] With Windows software $249.95.
[2] Not shipping at press time, scheduled to ship by publication date.

format groups of addresses from data base or comma-delimited ASCII files. Some programs operate in both TSR and stand-alone modes. If you want to sort and select your records and don't have a data base manager, look for a program that can manage a mailing list on its own.

All these programs give you a choice of preset or customized label formats. Many let you add graphics and bar codes, and most support the most common dot matrix and laser printer emulations.

Whichever labeling solution you choose, whether it's buying a new printer or labeling program or updating what you've got, one thing is clear: You now have one less reason to hang on to your typewriter.

Dan Miller is an assistant editor for PC World. *He can be reached on PC World Online (see page 8 for more information).*

For more information about all products in this article, circle reader service no. 906.

WHERE TO BUY

Avery Dennison
800/732-8379

Bloc Publishing
305/445-0903

CoStar Corp.
800/426-7827,
203/661-1540 (fax)

DacEasy Inc.
800/877-8088

Data Consulting Group
415/883-2300

E.R.M. Associates
800/288-3762,
818/707-3818

Nor Software Inc.
908/291-2991

Power Up Software Corp.
800/851-2917,
415/345-5900

Reinius Software
209/296-4299

Seiko Instruments USA Inc.
800/888-0817,
408/922-5900

Useful Software
818/880-9128

ZPay Payroll Systems Inc.
800/468-4188,
813/866-8233

Preset label/ envelope formats	Supports PCX clip art	Maintains mailing lists	Selection/ sorting capabilities	Prints/ calculates bar codes	PRINTER SUPPORT: Epson	IBM Proprinter	HP LaserJet	Reader service number
258	Y	Y	Y/Y	Y/Y	Y [2]	Y [2]	Y [2]	809
30	N	Y	Y/Y	Y/Y	Y	Y	Y	810
2	N	Y	Y/Y	Y/Y	N	N	N	811
20	Y	Y	Y/Y	Y/Y	N	N	N	811
2	N	Y	Y/Y	Y/Y	N	N	N	811
5	N	Y	Y/Y	N/N	Y	Y	Y	812
7	N	Y	Y/Y	N/N	Y	Y	Y	813
12	N	N	N/N	Y/Y	N	N	Y	814
100	N	N	N/N	Y/N	Y	Y	Y	815
175	Y	Y	Y/Y	N/N	Y	Y	Y	816
10	N	Y	Y/Y	N/N	N	N	Y	817
1	N	Y	Y/Y	Y/Y	N	N	N	818
50	N	Y	Y/Y	N/N	Y	Y	Y	819
3	Y [6]	Y	Y/Y	Y/Y	Y	Y	Y	820

For more information about all products in this table, circle reader service no. 905.

Smallest media (inches)	Largest media (inches)	Resolution (dpi)	Maximum speed (seconds per label or envelope)	Prints bar codes	Prints graphics	Software included	Networkable	Warranty (years)	Reader service number
1.1 x 3.5	1.1 x 3.5	138	4	Y	Y	Y	N	1	805
1.1 x 3.5	1.1 x 3.5	138	3.5	Y	N	Y	N	1	806
1.1 x 3.5	2.2 x 4	138	3.5	Y	N	Y	N	1	806
1.1 x 3.5	1.1 x 3.5	150	10	Y	Y	Y	N	1	807
3 x 5	6.25 x 10.25	192	15	Y	Y	Y	Y	1	808
3 x 5	5.3 x 12	144	12	Y	Y	Y	Y	1	808

For more information about all products in this table, circle reader service no. 908.

A company of firsts. *Not only was NEC the first to introduce the fastest-spinning CD-ROM readers, we also introduced the first monitor color control system and the first active-matrix color notebook.*

NEC
Computers and Communications

Call 1-800-NEC-INFO. (In Canada: 1-800-343-4418.) Or via fax, call NEC FastFacts,™ 1-800-366-0476. Request 23766 for CD-ROM. *Single session disc only.

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Looks like someone just discovered CD-ROM with MultiSpin™.

The fastest-spinning readers ever. The InterSect™ CDR-74 and 84, only from NEC. Now they not only have the ability to access large amounts of information quickly and easily, but they provide you with endless Multimedia possibilities as well.

In fact, our MultiSpin technology can transfer data at a rate of 300 kb/sec. That's double the speed of any other CD-ROM reader. And, we have designed our readers to play back video without any pauses or lapses in motion.

But what happens to audio? Do human voices sound more like beings from another planet? Does music sound like a record being played at the wrong speed? Absolutely not. The amazing thing about MultiSpin technology is its ability to transfer data at twice the speed, while maintaining the standard 150 kb/sec rate for audio tracks.

Simply put, NEC's InterSect™ CDR-74 and 84 with MultiSpin™ are the speed champs of CD-ROM. What's more, our CD-ROM readers cover a full range of price and performance needs.

Choose from our external CDR-74 or internal CDR-84, with double dust doors and socketed firmware features. Or, if portability interests you, choose our CDR-37. All meet MPC Marketing Council guidelines for Multimedia computing, are Photo CD capable* and fully QuickTime™ compatible.

So next time you hear the words CD-ROM, think MultiSpin.™ And remember: it's hot, it's fast, it's only from NEC. And you don't want to be the last on your block to get one.

Because ⬆ is the way you want to go. NEC

Circle 194 on reader service card

SOFTWARE FOR THE PROFESSIONS

BY SCOTT SPANBAUER

IT'S MONDAY, 8 A.M.—do you know where your business is? If you're a doctor, lawyer, contractor, retailer, or real estate agent, you can try tracking your company's vital statistics by laboriously customizing *1-2-3* or a generic accounting package (or pay a programmer a substantial bundle to work up a custom application from scratch). Or you can tap the powers of one of hundreds of industry-specific, or vertical market, applications.

Vertical applications are created by people who know your business. Point-of-sale packages usually support bar code and credit card readers, for example, while most medical practice management applications include an electronic equivalent of the new HCFA 1500 Medicare form. Try squeezing one of those out of a general-purpose accounting package.

TIRED OF PUSHING GENERIC SPREADSHEET AND ACCOUNTING SOFTWARE TO THE LIMIT? VERTICAL MARKET SOFTWARE CAN SMOOTH YOUR PATH TO WEALTH—AND WEEKENDS.

Naturally, you have to pay for this kind of software customization. Generic spreadsheets, data bases, and accounting systems can cost as little as $300; vertical applications start a little higher—around $500—and top out at $10,000 or more.

Real Estate
Health Care
Construction
Point of Sale
Law
Real Estate
Health Care
Construction
Point of Sale
Law

For the extra investment, you get a lot more than just a preprogrammed product. Most vertical software developers sell their products through qualified dealers, who often will install the program and provide extensive on-site training and hand-holding. If things go wrong, competent help is usually a local phone call away.

THIS WAY UP

If vertical sounds like the direction you should be heading, let us give you a hand up. Starting with independent surveys of the field, we chose five of the most popular vertical market categories: point-of-sale, law, construction, health care, and real estate. After checking with experts and professional organizations, we selected some of the leading applications in each field for small businesses.

Choosing an application starts out easy. First, you'll have to decide between entry-level products, whose strength is ease-of-use, and more complex programs that provide better controls, reporting, and billing options. If you're not sure where you stand, look for a product that enables you to start small, and add power as you go. Many applications can grow with you by means of upgrades and added modules. Extra modules quickly add up, however, so make sure to price all of the extra-cost options you'll eventually need when comparison shopping.

Most vertical software is built around a basic accounting system that posts transactions either in batches or in real time. Batch processing speeds up data entry and helps you to catch errors before they are posted, but real-time posting of accounts allows you to find out where your business stands at any given moment and permits some billing methods the batch method does not. Just as with any accounting system, look for plenty of predefined reports and invoices that you can easily edit to suit your unique situation.

Vendors generally provide free demonstration versions of their products or live working models for a modest fee, which is usually applicable toward the purchase price. Make sure you also ask colleagues and professional organizations for recommendations before buying. At the end of this article we've provided a list of organizations that offer additional resources.

POINT-OF-SALE

POINT-OF-SALE (POS) software gives your retail emporium a cash register with a brain and a memory that automates inventory tracking. As they record every transaction, POS systems update your business's general ledger (G/L) automatically, helping you get an up-to-date picture of where you stand at any given time. Often, POS packages are but one part of a multimodule general accounting system that includes accounts payable (A/P), accounts receivable (A/R), payroll, and more. If you've set things up properly, your system will do handy things like generate a purchase order when your stock dips below a certain level.

Most PC-based POS applications are as easy for check-out people to use as an ordinary cash register. Moreover, POS software dealers generally sell, install, and support the necessary POS hardware, including cash drawers, bar-code readers, and credit card readers.

Key features to look for include integrated credit card processing; bar-code reading and printing; time-saving style, color, and size options for each item; and the ability to check for inventory at other locations. If you need to consolidate transactions from more than one location, many companies provide multistore communications modules.

Department Point of Sale 4.31

Although it seems a bargain-basement system at first glance, most of *Department POS*'s basic features (including A/R, bar coding, credit card authorization, inventory reporting, and password protection) cost extra, so shop carefully. The program also supports multistore installations and portable scanners for checking inventory. Freeman Software, 334 Fieldside Dr., Garland, TX 75043; 800/426-6598, 214/ 270-0625 (fax). $189 to $1713 single user, $489 to $2013 multistore. Free demo disk.

Reader service no. 690

The General Store 6.03

This 11-year POS veteran packs the basics plus credit card authorization; size/color/style matrices; and bar coding into a function-key-driven interface with no extra charge for LAN or multistore versions. *The General Store* can import data from 18 other POS programs, and Crichlow will convert any other system's data free. Crichlow Data Sciences, 2005 Old Greenbrier Rd. #103, Chesapeake, VA 23320; 804/ 523-6600, 804/523-4668 (fax). $995. Free demo disk; trial version $75 (refundable toward purchase).

Reader service no. 691

Keystroke POS 2.0

Keystroke's biggest plus, aside from real-time accounting, is its *Windows*-like interface, which makes extensive use of pulldown menus, pop-up windows, dialog boxes, push buttons, and context-sensitive help. Multistore and G/L modules are optional, and you can link *Keystroke* to Manzanita's *BusinessWorks* accounting series. Specialized Business Solutions, 215 Long Beach Blvd. #523, Long Beach, CA 90802; 800/359-3458, 310/432-3458. $695 to $1180 single user, $995 to $1480 network. Free demo disk; full evaluation version $45.

Reader service no. 692

The Retail Store Controller

MicroBiz claims their product is the best-selling POS program on the market. For a tantalizing price, it promises a spate of features, including a menued interface with lookup windows, password protection, and on-line help, as well as credit card and bar-code interfaces. MicroBiz doesn't offer its own accounting software modules, but *The Retail Store Controller* links to a number of third-party programs, including *One-Write Plus, ACCPAC, Simply Accounting for Windows,* and *Quicken.* MicroBiz Corp., 500 Airport Executive Park, Spring Valley, NY 10977; 800/637-8268, 914/425-4598 (fax). $695 single user, $1395 network.

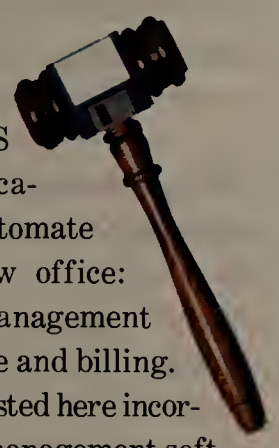
Reader service no. 693

TABS POS 6.35B, ELPOS 6.35B

This full-featured, premium-priced product is highly customizable and comes with *Foxbase*-compatible source code. Network-ready *TABS POS* offers automatic file transfers between stores; product lookups; inventory; bar coding, style/color/size matrices; and links to SBT accounting software. Credit card authorization is optional. *ELPOS* is a single-user, entry-level version offering the same features. Technologically Advanced Business Systems, Inc., 1239 E. Newport Center Dr. #106, Deerfield Beach, FL 33442; 305/570-8388, 305/570-8377 (fax). *TABS POS* $1295 to $2590 single store, $3295 to $11,295+ multistore; *ELPOS* $595. Interactive demos $40.

Reader service no. 694

LAW



TWO KINDS of applications automate your law office: case management and time and billing. All of the products listed here incorporate both. Case management software tracks case status; schedules lawyers; checks for lawyer or firm conflicts of interest; manages attorney caseloads; maintains a data base of clients, witnesses, experts, and opposing counsel; and assists in generating correspondence. Time and billing programs track attorneys' billable time and produce client invoices and handle payroll, check writing, and reporting.

Many programs also offer trust accounting and track the amount of business that attorneys bring to the firm. Some are better suited to smaller firms, or come in versions geared either to small or large offices. Make sure the one you buy can handle every staff member whose work is billable, including paralegals.

TABS III 3.6, Case Master III 1.2

Out of the herd of programs on the market, *TABS III* is the best-seller according to the American Bar Association (ABA); a competitor calls it the "*WordPerfect* of time and billing." Along with standard features, *TABS III* provides management reports and optional accounting and trust accounting modules. *Case Master III* integrates fully with *TABS III* and features docket, calendar, document, and conflict management. Software Technology, Inc., 1621 Cushman Dr., Lincoln, NE 68512; 402/423-1440, 402/423-2561 (fax). *TABS III* with *Case Master III* $3495 to $6545 single user, $5995 to $10,245 network. Free demo disk; full evaluation version $45 each.

Reader service no. 695

Juris 2.4

Complete, and backed by an active user group and a company with a 20-year track record, *Juris* can serve an unlimited number of lawyers or just one. Starting with the core of timekeeping, billing, and A/R, you can choose from a number of key add-ons, including docket/case management, conflict avoidance, and trust accounting. Juris, Inc., 151 Athens Way, Nashville, TN 37228; 615/242-2870, 615/256-2053 (fax). $2700 to $11,500 single user; $4150 to $16,000 network. Free demo disk.

Reader service no. 696

PCLaw 8.6, PCLaw jr 2.10

PCLaw does all the timekeeping, billing, and accounting basics—plus trust accounting and docket scheduling—and targets firms of 5 to 40 lawyers. An entry level version, *PCLaw jr,* is designed for the sole practitioner, supports up to five users, and offers some of *PCLaw*'s standard features as options. Alumni Computer Group, Inc., 155 North Michigan Ave. #722, Chicago, IL 60601; 800/387-9785, 416/292-1638 (fax). *PC Law* $1995 to $2795 single user, $2995 to $3795 network; *PC Law jr* $495 to $1695 single user, $845 to $2045 network. Interactive *PC Law* demo $100; free *PCLaw jr* demo disk.

Reader service no. 697

Legal Billing 4.2, General Ledger/ Accounts Payable/Checkwriting 3.0, Legal Calendar 1.2

This moderately priced, three-module system (time and billing, calendar, and G/L) was written by a practicing attorney. It's also ranked number one in the CTS guide to time and billing applications and boasts over 1000 installations. Strengths include real-time accounting and a built-in report writer. Tussman Programs, Inc., 24 Colorado Ave., Berkeley, CA 94707; 800/228-6589, 510/528-2009 (fax). $1290 to $2780 single user, $2890 to $3880 network. Free demo disks.

Reader service no. 698

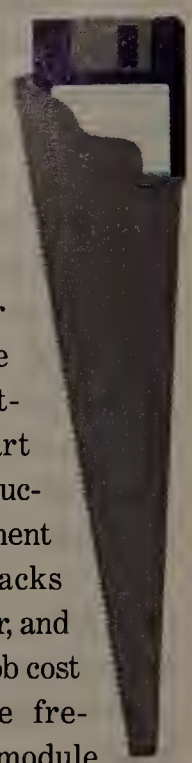
LegalEdge 3.01

LegalEdge users include one-person firms and multiple-attorney practices, but this application makes most sense for the latter. *LegalEdge* has the basics —case management, time and billing, trust accounting, and A/P—along with some extras, such as contingency fee calculation, mail merge, and an overlapping-window interface complete with pop-up reminder notes. A unique case-budgeting feature calculates projected versus actual expenditures and warns of potential liability. LegalEdge Software, 1150 First Ave. #700, King of Prussia, PA 19406; 215/337-5835, 215/

337-5845. $3800 to $11,250 single user, $8500 to $14,500+ network. Free demo version.

Reader service no. 699

CONSTRUCTION



THE BASIC organizing principle in any kind of construction business, whether big or small, is the job. Job costing—the heart of most construction management systems—tracks material, labor, and other costs. Job cost packages are frequently one module in an integrated accounting system that may include G/L, A/R, A/P, payroll, inventory, and purchase ordering. You're better off staying with one vendor's modules, but if you've already invested in accounting sofware, make sure the job costing system you want to buy can export data to it. Systems that come preloaded with the National Association of Home Builders (NAHB) chart of accounts can save you setup time.

Estimating is an important companion application; sophisticated estimators let you create standard assemblies (for example, a wall consisting of studs, wallboard, paint, trim, nails, and so on), then bring up any component on the assembly list and swap it for a more economical or fancier product. Look for products that come with standard preprogrammed assemblies, and digitizer interfaces for scanning materials quantities from plans.

Another tempting option, integrated scheduling, may work for small contractors who don't already use a project management program. But if you have a separate person doing scheduling, a good stand-alone project manager like *Primavera* may perform better.

Basic Builder II, Profit Builder, Pro Sub, Bid Team

Basic Builder II, which is geared to the small commercial and residential contractor, integrates the basics—job costing, G/L, A/P, and A/R—with optional payroll, billing, inventory, estimating, and report-writing modules. Pulldown menus and pop-up job and vendor lookups help the novice get right to work. *The Profit Builder* adds stronger management reporting and analysis; more optional modules, including purchase orders; and subcontractor tracking. It works on a network and links with *Bid Team,* CDCI's customizable estimating package. *Pro Sub* offers downscaled construction management for subcontractors with little time or money for more complete applications. Both *Basic Builder II* and *Profit Builder* are NAHB approved. Construction Data Control, Inc., 4000 DeKalb Technology Pkwy. #220, Atlanta, GA 30340; 800/285-3929, 404/457-7725. *Basic Builder II* $1995 to $5075; *Profit Builder* $2995 to $9735; *Pro Sub* $695 to $1280; *Bid Team* $995 to $3995. Demo disks $10 each.

Reader service no. 700

Buildsoft 2.58

UFAB's comprehensive system targets home builders with a dozen or so projects per year. Originally designed by builders rather than accountants, *Buildsoft* is semimodular, rolling the basics plus estimating into one moderately priced bundle. UFAB is particularly proud of its critical path scheduling module, which creates Gantt charts, schedules, and task lists. *Buildsoft* is NAHB approved. User Friendly Applications Builder, Inc., P.O. Box 13893, Research Triangle Park, NC 27709; 800/999-8322, 919/361-1224 (fax). $2495 to $4995; network license $1495. Demo disk $15 (refundable).

Reader service no. 701

Business Management System 5.0, Professional Estimating 4.5

Not intended for contractors who handle accounting in their spare time, *Business Management System* is a full-strength, modular job costing and accounting system. Among the extra-cost options are a purchase order system, scheduling, a report writer, network capability, and *Professional Estimating.* Home builders who market their own properties will find Enterprise Computer Systems' sales tracking, proposal-generation, and prospect follow-up options a plus. All three packages are NAHB approved. Enterprise Computer Systems, Inc., P.O. Box 2383, Greenville, SC 29602; 800/992-6309; 803/234-7676 (fax). $1495 to $7060 single user, multiuser license $2495. Demo disk and report samples $10.

Reader service no. 702

Construction Accounting 5.0, The Estimator 1.010

Yardi's integrated construction management offering is moderately priced and features a modern user interface with pulldown menus and scrollable lookup windows. *Estimator* is a stand-alone program that supports assemblies and tracks subcontractors but doesn't work with digitizers or networks. *Construction Accounting* is NAHB approved. Yardi Systems, 819 Reddick St., Santa Barbara, CA 93103; 805/966-3666, 805/963-3155 (fax). *Construction Accounting* $795 to $1785 single user, $1595 to $2590 network (payroll module not networkable); *Estimator* $795. Free demo disk.

Reader service no. 703

The Construction Manager 1.4, Advanced Construction Estimating 2.12

Flexibility is the rule in *The Construction Manager 1.4,* a premium-priced modular system that includes basic accounting, payroll, inventory, purchase orders, and a custom report writer. *TCM* lacks a scheduling module but exports data to *Primavera*'s project manager. *Advanced Construction Estimating*

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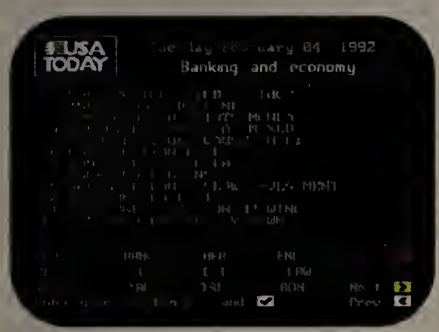

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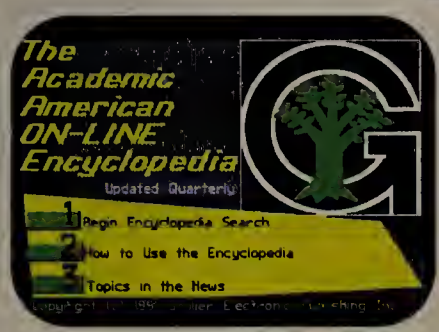

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NATIONAL VIDEOTEX

Circle 178 on reader service card

offers a modern windowed interface, tight links with *TCM*, and a library of prefab assemblies. *TCM* is NAHB approved. Software Shop Systems, Inc., 1340 Campus Pkwy., Wall, NJ 07719; 800/554-9865, 908/938-3200. *TCM* $4495 to $9995 single user, $5995 to $11,495 network; *ACE* $4995 single user, $7495 network.

Reader service no. 704

Easy Build 6.0, Builder's Package 6.0, Contractor's Package 6.0, Power Estimating System

ISS's three programs handle 12, 35, and 1000 active jobs, respectively, to fit your company's size. There's a smooth upgrade path from one package to the next, should you outgrow either of the first two. All three programs include basic accounting, with payroll, and networking is optional. ISS also sells a quartet of similarly job-rated stand-alone estimating products, the *Power Estimating System*, which integrates with the main program. *Contractor's Package* is NAHB approved. Industry Specific Software, P.O. Box 25249, Greenville, SC 29616; 800/877-2496, 803/297-7833 (fax). $1530 to $4240; network license $600; upgrades $1000 to $1335; *Power Estimating System* $495 to $1250. Free demo disk.

Reader service no. 705

Medallion HomeBuilder 1.a, Precision Estimating 4.5

Timberline Software is best-known for its high-end construction management systems; *Medallion HomeBuilder*, however, is a midsize, integrated product that incorporates the standard accounting functions and offers an optional payroll module as well as a multiuser version. The *Precision Estimating* series, with entry-level, intermediate, and advanced flavors, comes with a seemingly endless array of options, including a digitizer interface and links to *Primavera* and *Microsoft Project*. Timberline Software Corp., 9600 S.W. Nimbus, Beaverton,OR 97005; 800/628-6583, 503/644-8155. *Medallion HomeBuilder* $1590 to $2080 single user, $1790 to $2770 network. *Precision Estimating* $395 to $2990. *Precision Estimating* demonstration disk $10.

Reader service no. 706

HEALTH CARE

MEDICAL PRACTICE management applications are built around a patient tracking and billing core. Insurance company and Medicare billing are the most important tasks for this product category. The more complete programs also offer a patient-scheduling module.

Be sure to choose an application that bills via the new HCFA 1500 Medicare form, which became mandatory on May 1, 1992, and is being adopted by a growing number of states and insurance companies as well. Also, physicians need open-item billing that handles multiple payments by the government, insurance companies, and patients for each item—simple balance-forward systems can't do this.

Also look for Electronic Claims Submission (ECS) and diagnostic coding. A number of insurance companies are now beginning to accept electronic claims, and President Bush is pushing for a dollar-per-claim surcharge for paper-based Medicare submissions. Standard ICD (diagnostic) and CPT (treatment) codes are required on insurance and Medicare billings; many programs also offer handy code lookups.

Lytec Medical 3.5

This program is packed but costs only a tenth of what its competitors charge. The key features are all here: open-item billing that maintains detailed records of charges as long as you want them; support for the new HCFA 1500 and ECS; a mouse-aware interface with pop-up appointment scheduling; and practice analysis that tells you where your money's coming from. *Lytec Medical* lacks a general ledger but offers links to *DacEasy* and *Quicken*. Lytec Systems, Inc., 6975 Union Park Center #270, Midvale, UT 84047; 800/735-1991, 801/562-0111. $199 single user, $499 network. Demo version $22 plus $7.50 shipping.

Reader service no. 707

Cactus/MD 6.27, Cactus/DDS 6.27

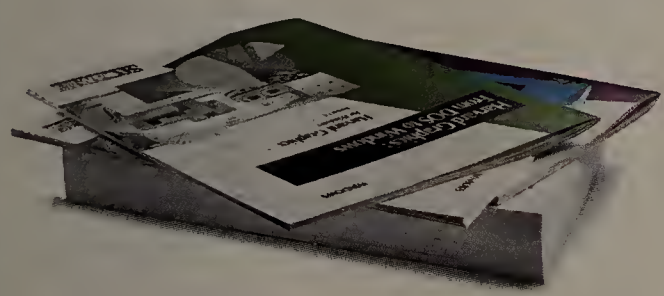
The North Carolina Medical Society recently endorsed the Cactus Medical Group's programs, which integrate insurance and patient billing, reporting, and word processing and link up with optional accounting, diagnostic coding, scheduling, records management, and Electronic Claims Submission modules. *Cactus/DDS* also produces standard American Dental Association diagnostic codes and claims forms. Both of the Cactus products have been updated to handle the new HCFA 1500 form. The Cactus Medical Group Ltd., One Copley Pkwy. #200, Morrisville, NC 27560; 800/877-9495, 919/481-9307 (fax). $2895 to $5485 single user, $4395 to $7385 two users, each additional user $495. Free demo disk; limited full version with manual $50 (applicable toward purchase).

Reader service no. 708

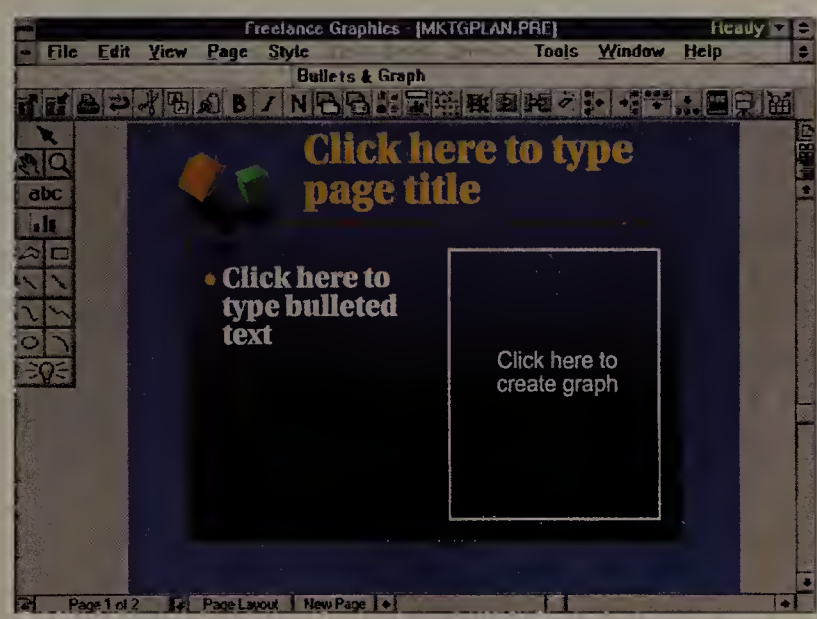
CompuMedic/Open Item, DentalWare

Thanks to real-time accounting, *CompuMedic/Open Item* allows partially paid items to remain open pending insurance company, Medicare, or patient payments. (*DentalWare* is a balance-forward system.) Both are network ready and incorporate patient history data bases and appointment sched-

The trouble with Harvard is you need too much education to get into it.



Harvard Graphics for Windows



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Index to Professional Resources

Now that we've given you a taste of the most popular applications for your business, you may want to learn more about what's available and how organizations go about "approving" certain products. Here's a brief directory to key trade organizations for the types of businesses discussed in this article.

GENERAL Solutions, 2444 Early Settlers Rd., Richmond, VA 23236. *The Accounting Library* is a computer-based needs-analysis system that lists 90 different accounting applications, some vertical.

CTS, 11708 Ibsen Dr., Rockville, MD 20852; 800/433-8015, 301/468-4800. Publishes reviews of a variety of accounting applications, including construction-, law-, and medical-specific software, which include needs-analysis templates for *1-2-3*.

POINT-OF-SALE Indiana Cash Drawer Co., 1315 S. Miller St., P.O. Box 236, Shelbyville, IN 46176; 800/227-4379, 317/398-6643. Publishes the *POS Source list*, a list of available POS applications.

LAW American Bar Association Legal Technology Resource Center, 750 N. Lake Shore Dr., Chicago, IL 60611; 312/988-5465. Provides law professionals with information on technology from its voluminous data bases and computer bulletin board. The Center also develops guidelines for software development and certifies products.

CONSTRUCTION CIP Communications, 6585 Commerce Blvd. #292, Rohnert Park, CA 94928; 707/823-4211, 707/823-1007 (fax). Publishes the *Construction Computer Applications Directory* every other year, listing hundreds of applications. CIP also publishes a monthly newsletter.

National Association of Home Builders, 1201 15th St. NW, Washington, D.C. 20005. 800/368-5242, 202/822-0200. NAHB's Software Review Program thoroughly evaluates construction software; the results are available in its *Approved Product Summaries* publication.

HEALTH CARE Jewson Enterprises, P.O. Box 1331, Menlo Park, CA 94026-1331; 415/368-6570. Market analysis firm that maintains a satisfaction rating data base for more than 1200 practice management applications.

REAL ESTATE National Association of Realtors, 430 N. Michigan Ave., Chicago, IL 60611-4087; 312/329-8200. NAR's Business and Technology Committee produces forums and showcases new products at real estate conventions.

uling; basic accounting modules are optional. *CompuMedic/Open Item* supports ECS. Data Strategies, Inc., 15373 Innovation Dr. #210, San Diego, CA 92128; 800/875-0480, 619/451-0080 (fax). *CompuMedic/Open Item* $7600 to $9600; *DentalWare* $2600 to $5000. Free demo disk.

Reader service no. 709

MPM II, Medical Practice Management 4

MPM II is billed as the painless way to manage your practice, with a mouse-aware, menued interface; pop-up appointment scheduler that handles multiple doctors; ECS; open-item accounting; and support for the new HCFA 1500 form. *Medical Practice Management 4* is its bigger sibling, with more billing options, in-depth reports on the practice's financial status, diagnostic coding references, and even a breakdown of the amount of time spent on a particular procedure. Cyma Systems Inc., 1400 E. Southern Ave., Tempe, AZ 85282; 800/292-2962, 602/831-2607. *MPM II* $995 single user, $1295 network; *Medical Practice Management 4* $3185 single user, $3585 network. Free demo disk; limited evaluation copy $45.

Reader service no. 710

MD VersaForm

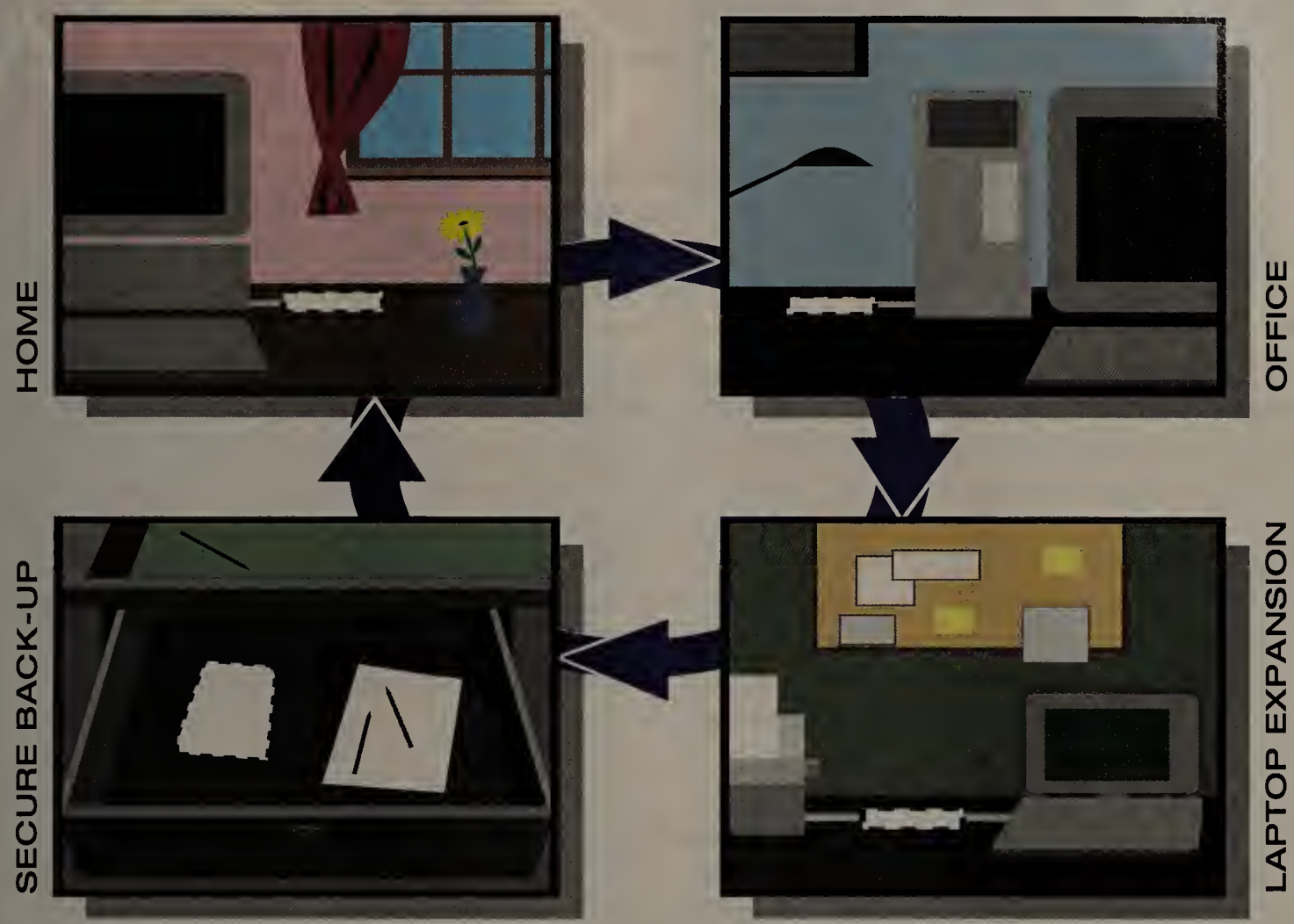
AST's completely integrated system promises to mind every aspect of your practice, right down to printing a deposit slip before you head off to the bank. Its interface mimics the familiar manual patient ledger—most patient information, including medical history, is displayed on one screen. *MD VersaForm* handles ECS and the new HCFA form and is programmable—the program's data base engine and source code are included. Applied Software Technology, 591 W. Hamilton Ave. #201, Campbell, CA 95008; 800/678-1111. $1295 single user; $2495 network. Free demo disk.

Reader service no. 711

Medical Office Management 4.50, Dental Office Management 4.50

Ease-of-use is the strength of these products —a doctor's office manager can install and run them without train-

Mobile Disk: The Computer Commuter



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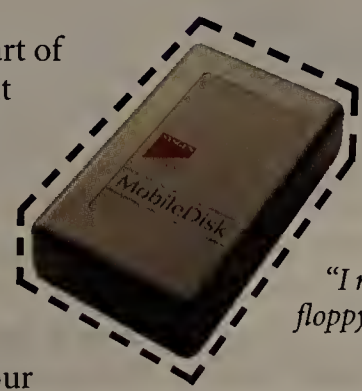

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ing. Both focus on accounting, with pull-down menus and a help prompt line at the bottom of each screen. You can produce HCFA 1500 forms with ICD, CPT and, in the dental product, ADA codes, but neither program incorporates ECS. International Micro Systems Inc., 4343 Merriam Dr., Overland Park, KS 66203; 800/255-6223. $1995 to $4320 single user; $2495 to $5320 network. Demonstration version $35.

Reader service no. 712

Medical Practice Manager 6.2, Dental Practice Manager 5.0

Written in *FoxPro,* these systems are highly customizable and come with source code. The company also has over 100 custom data bases for specializations like medical labs, optometrists, and radiologists. All these packages include a menued interface, open-item billing, diagnostic code lookup, ECS, password protection, and links to SBT's accounting modules. Pacific Medsoft, Inc., P.O. Box 7049, 925 North Lake Blvd. #B301, Tahoe City, CA 96145; 800/ 343-5653, 916/583-1532 (fax). $3995 to $9263 single user, $5495 to $8495 network. Interactive demo $49, $25 for dental.

Reader service no. 713

REAL ESTATE

SURE, REAL estate agents work in offices, but they're also highly independent, go-getting, "people" people. So contact-management programs that watch over their hectic schedules, keep track of escrows, and help agents prospect for new buyers and sellers are valuable real estate tools. Look for auto-dialers, utilities that store and analyze comparable properties, and discounts for Certified Real Estate Specialist (CRS) certificate holders. And remember to get a good referral from a satisfied user before closing the deal.

CONTACT MANAGEMENT PROGRAMS CAN KEEP TRACK OF ESCROWS AND HELP REAL ESTATE AGENTS PROSPECT FOR CLIENTS.

Real Estate Specialist 3.3

RES's relational data base tracks people, properties, and referrals; minds your schedule (with advance warning); lets you print agendas and reports; and includes an auto-dialer and context-sensitive help. You can organize clients into groups by any criteria, such as property type or what they do for a living, and print mail-merged letters and cards for one or more groups. Hibbs Henle Nelson Corp., 1115 Foothill Blvd., La Canada, CA 91011; 818/952-1000, 818/952-1115 (fax). $598, discounts for agents with CRS certificate.

Reader service no. 714

The Broker's Book 1.0

Besides basic scheduling, client, escrow, and property tracking, *The Broker's Book* provides a number of financial analysis tools, including a quick cash-flow report for a property's first year and a long-term analysis for up to 30 years. It performs mail merges, prints labels and envelopes, and creates lists of comparable properties. Yorkstone Technologies, 6720 Centinela Ave., Culver City, CA 90230; 310/397-4265, 310/391-7760 (fax). $495. Free trial version.

Reader service no. 715

Howard and Friends 9.0

Quirky-sounding *Howard and Friends* is anything but, and it claims the largest user base in the industry. Along with the key client, property, and escrow trackers, the program's correspondence section has more than 100 stock cards and letters, including standard liability-reducing documents. *H&F Office Version* gives an unlimited number of agents password-protected access to the system on one computer. EdgeTech Software, 12602 Lake Ridge Dr., Lake Ridge, VA 22192; 703/491-8480, 703/497-2341 (fax). $495 single user ($100 CRS discount), $850 multiuser (unlimited); trial version $30. Free demo.

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Real/Quick 4.0

If you already use Symantec's *Q&A 4.0, Real/Quick* is an an easy, inexpensive way to automate your sales and listing prospects. In addition to standard tracking features, it has nice extras: a quick buyer-qualification and closing costs calculator, seller net proceeds sheet, loan comparison, comparative market analysis generator, and an optional utility that imports listings from some multiple listing services. Computer Smarts, 1240 N. Lakeview Ave. #120, Anaheim, CA 92807; 714/777-2130, 714/777-1983 (fax). $349 to $548, with *Q&A 4.0* in bundle with *Real/Quick* $549 to $648.

Reader service no. 717

Realty Ally 4.0

The only networkable product featured in our listing, *Realty Ally* has all the contact management elements, including an appointment tickler, word processing and mail merge capabilities, custom reports, and a real estate calculator. In addition to all this, you get a phone dialer, expense account reporting, and a collection of prewritten prospecting letters. Scherrer Resources, Inc., 8200 Flourtown Ave. #2, Wyndmoor, PA 19118; 215/836-1820, 215/836-1804 (fax). $395 single user, $850 to $1895 network. Free demo disk.

Reader service no. 718

Scott Spanbauer is a contributing editor for PC World.

For more information about all products in this article, circle reader service no. 907.

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MPC WORLD

August 1992

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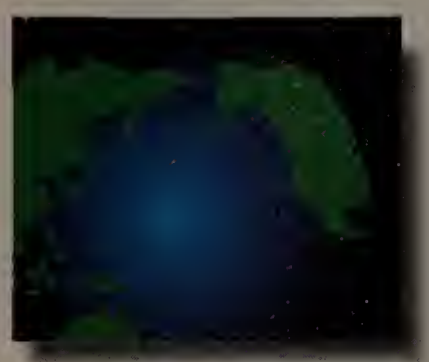

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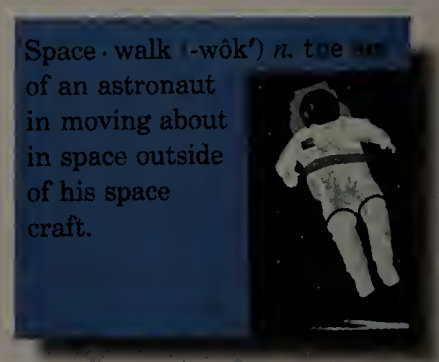

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MPC WORLD

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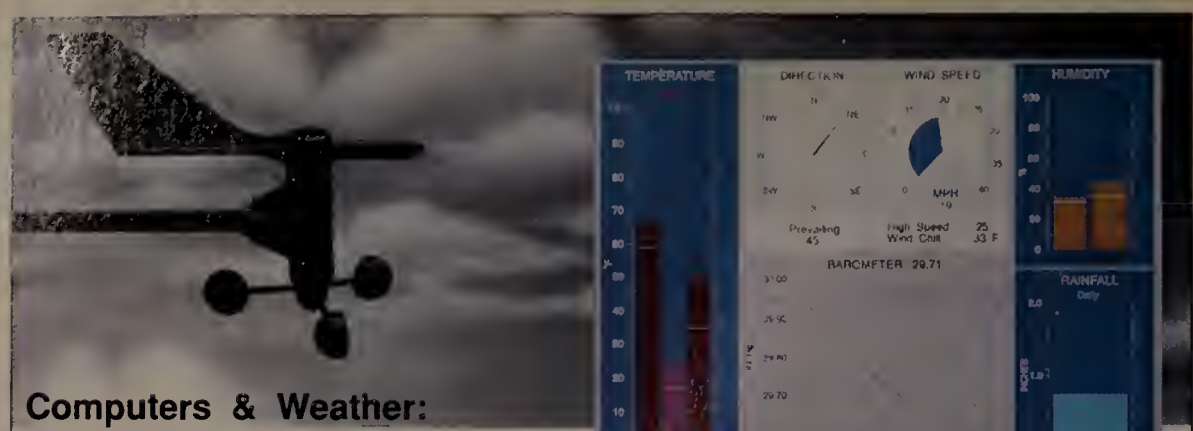

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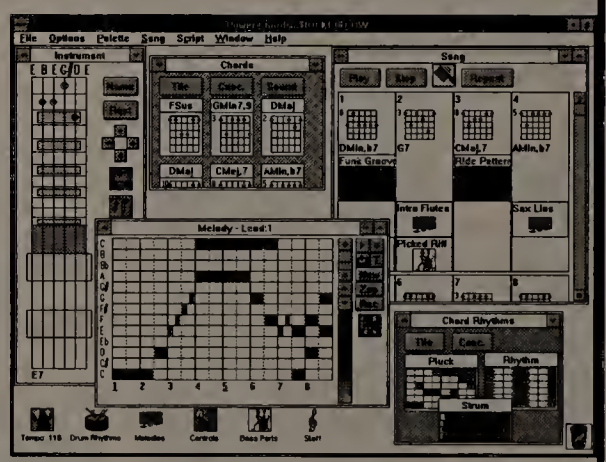

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What a Card

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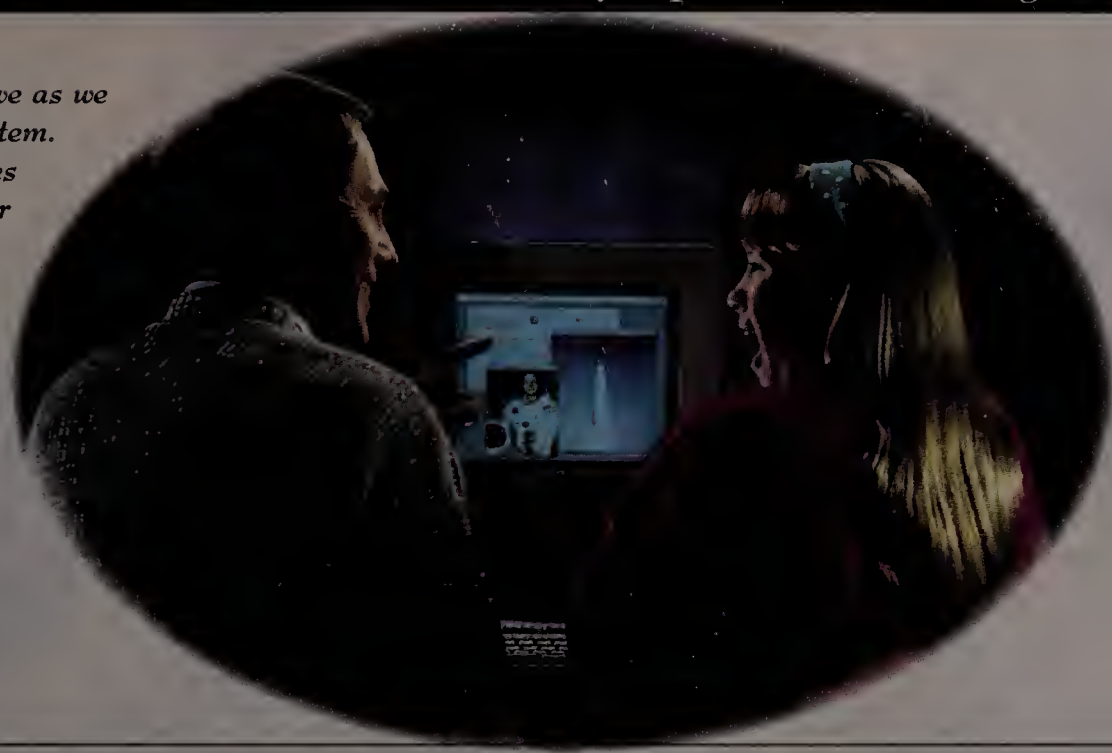

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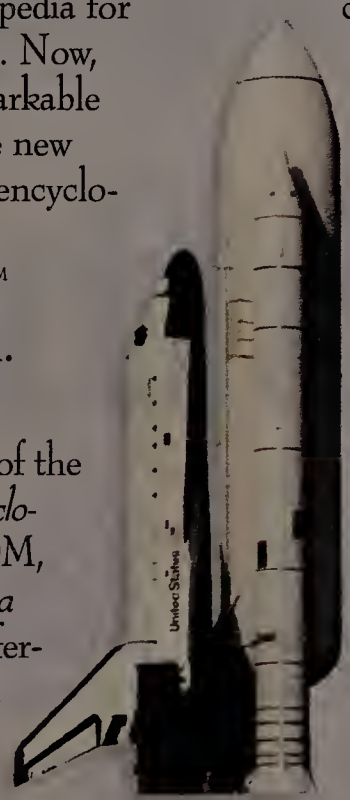

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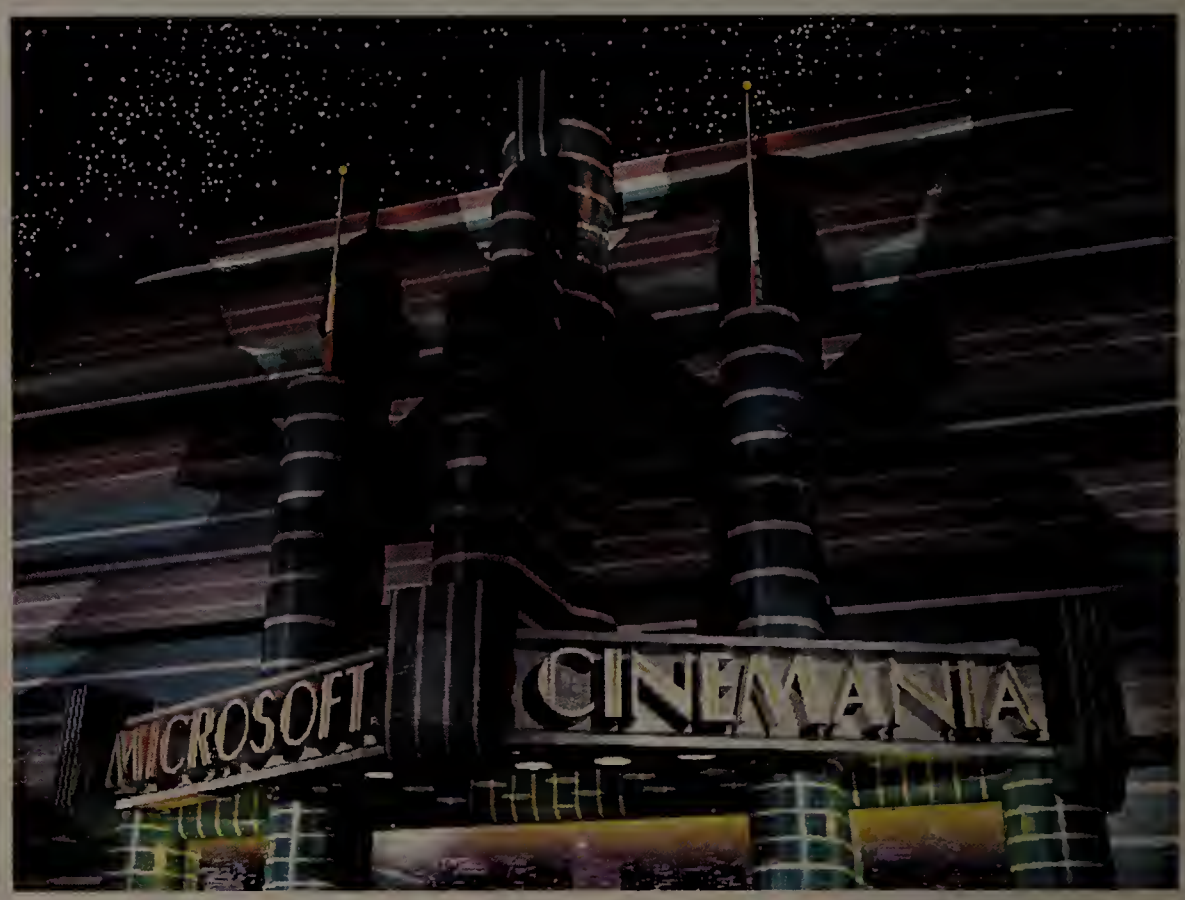

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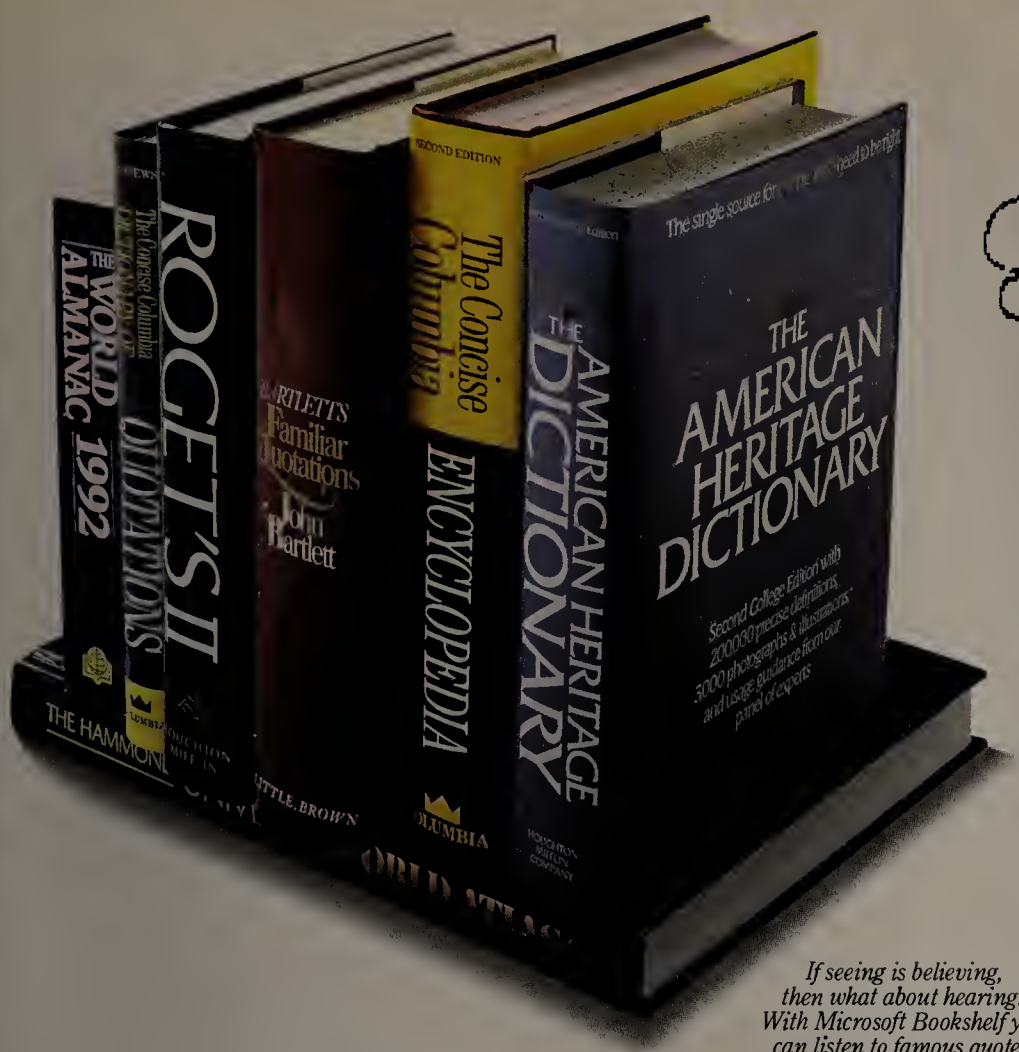

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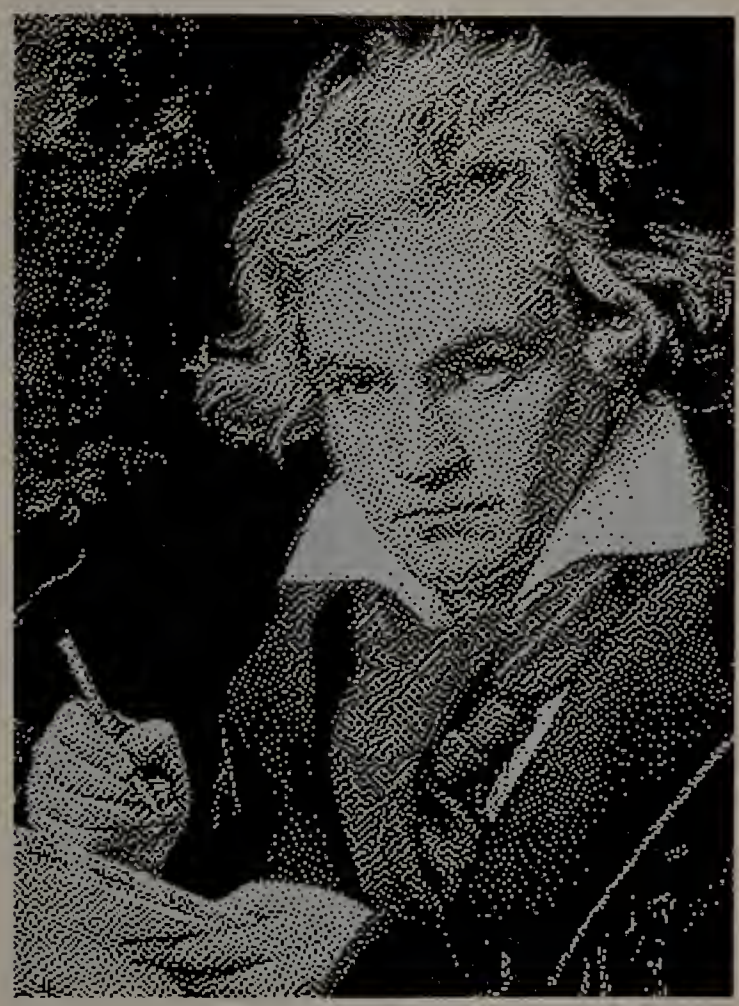

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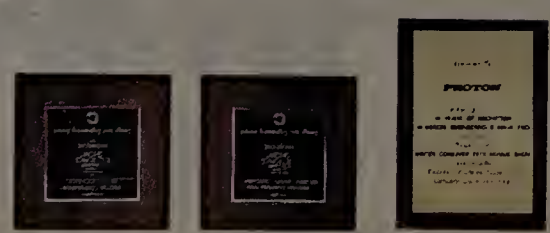

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By Sandra Rosenzweig

Inbox

Everything Old Is New Again

Some of you are reading *MPC World* for the first time, so let me introduce us. This is the fourth issue of *MPC World* and the first inside *PC World*. Coming into the *PC World* fold (get it?) means we've doubled our circulation but kept our focus on multimedia at home—whether it's working, playing music, editing videos, learning French, or teaching your children to read.

In the past few months, we've reviewed almost every CD-ROM game and reference disk on the market, and researched each shipping multimedia PC system and upgrade kit, sound board, and multimedia-capable CD-ROM drive. In the coming months, we'll do more of the same, covering every leisure-time and work-at-home multimedia product or trend that comes along.

Multimedia is a confusing term. It's a word without tangibility. It has no immediate emotional content. For that reason, it probably has a short shelf life. Even today, the most effective multimedia programs don't call themselves multimedia. For example, The Software Toolworks' Miracle Piano System (keyboard and software that run off a PC, Mac, or Nintendo) uses lots of sounds and animations, a database, and some inspired feedback to teach a novice how to read music and play simple piano pieces to the accompaniment of simplistic Oscar Petersons or Lawrence Welks. Does Software Toolworks call it multimedia? Of course not. They call it piano lessons.

One definition of multimedia is anything that combines sound, motion, and data on the desktop. Another is that point where computer electronics and consumer electronics meet. Are the computer speakers in this issue multimedia? They are in the hands of Hans Fantel, stereo critic for the *New York Times*. How about video games? They combine music, animation, and video—what more do you want? (See Corey Sandler's exclusive peek at Konami's new football game—almost as good as owning your own football team, and a whole lot cheaper.) Is Windows 3.1? Yes, but it's not that easy. Explore with us the truth, the whole truth, and nothing but the truth about multimedia and Windows 3.1.

As for the future, tune in next month for our annual systems and upgrade kit Buyers' Guide. And our Readers' Choice Awards—the best multimedia products on the market according to *MPC World* readers. And a multimedia perspective on the hot new CorelDRAW 3.0 (fully integrated drawing, painting, and real multimedia plus more sound, animation, and drawing clips than most professionals will use in a lifetime) and Virgin Games' *Seventh Guest*, absolutely the most gorgeous, sonorous game ever developed.

Early next year, we'll have a flood of new CD-ROM titles as Compton's New Media and Sony's Affiliated Label programs stimulate the production and distribution of reference titles, games, sound and animation clips, foreign language courses, and interactive books for adults and children. If you don't have a CD-ROM drive now, ask for one for the holidays.

Not everything in life is multimedia. Really. If you live out of a Le Fax or Day Runner as I do, grab Portfolio Systems' Dynopage for Windows, due out any second. (They've been saying that for six months; must be hard to port this precious little utility from the Mac to Windows.) It prints any file on your PC in miniature for use in a small organizer. It prints long double-sided documents (almost as complicated as playing chess on a computer); it reduces, say, a 300-page address book so that three pages fit on one letter-size sheet, and then prints them double-sided so that every page comes out in order. It prints booklets, trifold brochures, business cards, and more.

Yes, we're talking print here. Print won't die in your lifetime or mine. What would kill it off? Electronic books? Maybe for reference but not for pleasure reading. Electronic Filofaxes? Maybe, but if you thought a $165 Filofax notebook with fillers was expensive, wait till you shell out $300 to $1000 for a Newton (from Apple, Sharp, and a bunch of other manufacturers). These products hint at the future overlap of consumer and computer electronics, but true multimedia will offer us products we've never seen before (as the phonograph and the VCR did).

Multimedia is the future. *MPC World* is your window into that future. Look for us every other month, same place, same channel, at your local newsstand. M

Can you imagine life without the phonograph or the VCR? That's how we'll view multimedia in the 21st century.

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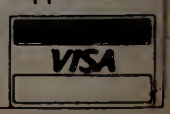

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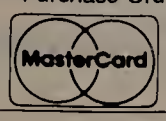
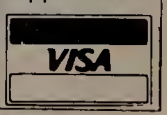




WINDOWS DOES MULTIMEDIA

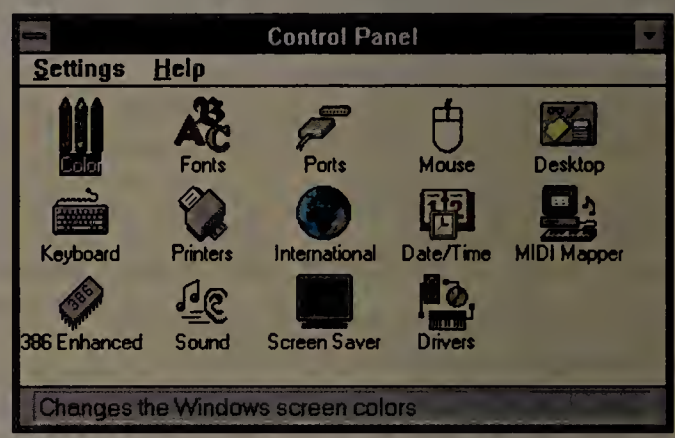
By JOHN WALKENBACH

UNLESS YOU'RE A HERMIT, YOU ALREADY KNOW THE ADVANTAGES OF WINDOWS 3.1: IT'S MORE STABLE, RUNS FASTER, AND HAS A BUILT-IN SCALABLE-FONT SYSTEM. BUT MICROSOFT HASN'T FULLY PROMOTED THE MULTIMEDIA SIDE OF WINDOWS 3.1; THE PRODUCT PACKAGING NEVER MENTIONS IT. FACT IS, WINDOWS 3.1 HAS ALL THE MAKINGS OF A NEARLY IDEAL ENVIRONMENT FOR MULTIMEDIA SOFTWARE APPLICATIONS.

A LONG TIME COMING

When Windows first appeared in 1987, even Microsoft didn't foresee it evolving into the major force it is today. Windows actually floundered until the May 1990 release of version 3.0; that version sold like hotcakes and spawned hundreds of Windows applications. But Windows users who craved sound, music, and motion video support had to wait more than a year for Microsoft and IBM to develop the multimedia extensions for Windows—a special version of Windows 3.0a with dynamic link libraries and drivers that allowed the software to communicate with multimedia hardware. Until IBM started selling the extensions a few months ago, the only legal way to get your hands on a copy was from certified MPC developers who bundled the extensions with their hardware.

Windows 3.1 includes most of the multimedia capabilities found in the obsolete multimedia extensions (see the "Upgrading from Multimedia Extensions" sidebar), and now do-it-yourself types can create their own Windows-based multimedia PC without resorting to an official upgrade kit. Hook up a compatible CD-ROM player and sound card to a 386 or better system with at least 2 MB of RAM, install the appropriate drivers, and you'll be riding the MPC wave. (Rolling your own isn't easy, though. See Inbox in June/July 1992.)



The Windows 3.1 Control Panel sports several new options. The Sound, Drivers, and MIDI Mapper icons are for multimedia.

BEYOND BLIPS AND BEEPS

Windows 3.1 supports the three types of sound that can be used with multimedia: waveform audio, MIDI, and CD audio. You will, of course, need a compatible sound board and CD-ROM player to unleash this new power. Waveform audio is essentially digitized sound that's stored in a file—usually with a WAV extension. Multimedia applications use these files to provide narration, music, and sound effects. You can also instruct Windows to play selected WAV files when certain events occur, such as a user error. Windows 3.1 includes only four sample WAV files, but others are available from bulletin board and online services, and you can even record your own sound files from an audio CD or through a microphone connected to your sound card.

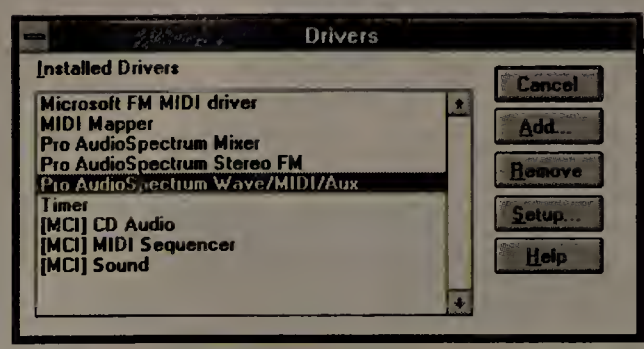
MIDI song files, identified by their MID extension, contain instructions that allow your PC to play the synthesizer on your sound board or to control external MIDI synthesizers or sound modules (such as a Roland Sound Canvas or MT-32). Again, the pickings are slim since Microsoft includes

TONY STROMBERG

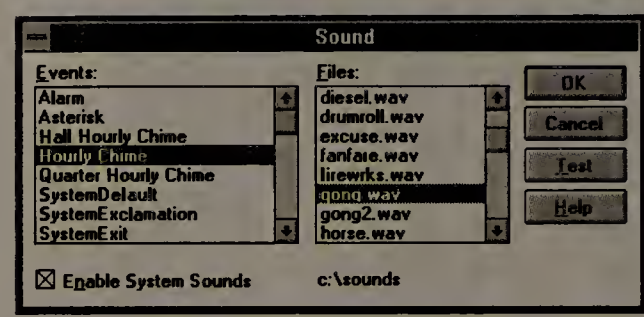
only one sample MIDI file. But thousands of MIDI files—in all musical styles—are available from BBSs and commercial sources. And if you're musically inclined, you can compose your own MIDI files or modify MIDI songs using what's known as sequencer software (not included with Windows). Windows sequencers include Master Tracks Pro from Passport Designs, Cadenza for Windows from Big Noise software, and Cakewalk Pro for Windows from Twelve Tone Systems.

The final sound medium, audio CD, plays standard compact discs on your CD-ROM drive. Some applications, such as Microsoft's *Multimedia Beethoven*, mix CD audio with text and graphics on a single CD-ROM.

As you explore Windows 3.1, you'll see references to MCI. This doesn't refer to the long-distance phone carrier, or even the E-mail system. Rather, MCI stands for Media Control Interface—a high-level interface that allows software to control a variety of multimedia devices and files in a standard way. Programmers use MCI to control waveform audio, CD audio, MIDI files, and even VCRs and videodisc players. Windows 3.1 includes a simple program, Media Player, that controls any installed MCI device.



The Drivers dialog box is where you install, configure, and remove drivers for your multimedia devices.



The Sound dialog box lets you associate waveform audio files with specific events.

The MIDI Mapper dialog box provides a way to adjust your MIDI setup so you don't end up with a flute playing bass guitar.

THE MAGICAL MULTIMEDIA TOUR

Now that you know the basics, let's take a guided tour of the multimedia components in Windows 3.1. We'll cover the Control Panel first, and then jump into the multimedia accessories.

The Windows Control Panel application lets you set up many aspects of your system. The Windows 3.1 Control Panel has three icons relevant to multimedia: Drivers, Sound, and MIDI Mapper. This new control panel also accommodates third-party programs. For example, a trackball or joystick manufacturer could include an icon that you simply click on to have your system accept the hardware.

The Drivers icon installs, configures, and removes drivers for specific hardware devices. Think of a driver as an intermediary between Windows and the hardware. You need a driver for each multimedia device you install—sound cards, CD-ROM drives, MIDI interfaces, and potentially VCRs and videodiscs. Windows 3.1 includes drivers for some devices, but for others you have to contact the hardware manufacturer or download the proper driver from Microsoft's Supplemental Driver Library (see the "Where to Get Windows 3.1 Drivers" sidebar). Installing a driver is fairly straightforward, but you have to restart Windows to activate the driver once it's installed.

The Control Panel's Sound icon associates specific WAV files with certain events. For example, be greeted by Bart Simpson every time you load Windows, or replace the normal error beep with an "oops" sound. This can be amusing at first—very Macintosh-like—but the novelty soon wears off. Perhaps the most useful feature of the Sound icon is its Test button, which quickly auditions WAV files.

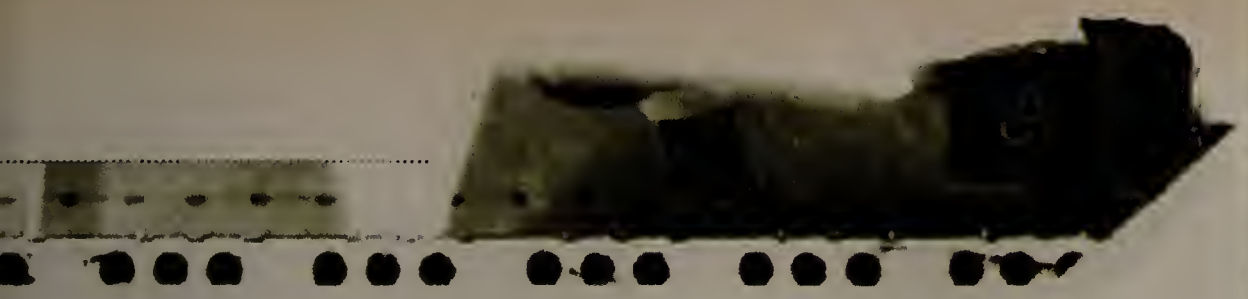
The MIDI Mapper icon appears in the Control Panel only if you installed a MIDI device. MIDI Mapper selects a MIDI setup for your sound card or synthesizer to ensure that the sounds generated are appropriate—for example, that each synthesized instrument actually sounds like its real-life counterpart. General MIDI is a standard mapping of instrument sounds to MIDI codes. If your sound card or module doesn't conform to the general MIDI standard, you'll need to remap the sounds or the MIDI files will sound terrible—a flute playing a bass guitar line just doesn't cut it. Windows includes a few setup files for common sound devices. You can edit these or create your own. But be sure you understand what you're doing, and keep the user's manual for your sound device handy.

UPGRADING FROM MULTIMEDIA EXTENSIONS

If you've been using Windows 3.0 with the multimedia extensions and want to upgrade to Windows 3.1, install the new version in the same directory as the old version. If you don't, the program will not be properly configured.

Don't expect to find any new multimedia tools or toys in Windows 3.1. In fact, you'll give up a few things. The Music Box application, which plays audio CDs, isn't fully compatible with Windows 3.1. It plays CDs, but you can't store title and track information. Also, Microsoft claims that the Alarm Clock program may not work properly.

But the worst part is that Windows 3.1 may not include a driver for your particular sound card—and the drivers included with multimedia extensions probably won't work. Windows 3.1 ships with drivers for Ad Lib, Creative Labs' Sound Blaster (version 1.0 and 1.5), and Media Vision's Thunder Board. In addition, the package includes drivers for Roland's LAPC1 and MPU-401 MIDI interface. If you have any other sound card, procure the proper driver from the manufacturer or download one from a BBS.—J. W.



NEW ACCESSORIES

You'll also find two new accessories that support multimedia: Media Player and Sound Recorder. Media Player controls hardware and plays various media files. Start by selecting the device from the pull-down list that displays all installed MCI devices. If it's a simple MCI device such as an audio CD, click the Start icon to begin. For compound devices such as WAV players or MIDI files, specify which file you want to play. Media Player's controls are like those found on audio CD players—Play, Pause, Stop, and Eject.

If your system has a CD-ROM drive set up when you install Windows 3.1, the Windows Setup programs automatically install the MCI audio CD-ROM driver, so you can play your favorite tunes in the background using Media Player or other software. However, if you install your CD-ROM after you set up Windows, prepare for some manual finagling. You'll need to copy the MCICDA.DR_ driver file from the Windows installation disk (disk 5) to your WINDOWS\SYSTEM directory, decompress it using the EXPAND.EXE utility in your WINDOWS directory, and install it using the Drivers icon in the Control Panel.

The other multimedia application, Sound Recorder, records WAV files using a microphone attached to your sound card or from an audio CD. The program records only in 8-bit resolution, not the higher-fidelity 16-bit mode supported by some of the newer sound cards, such as Media Vision's Pro AudioSpectrum 16. Sound Recorder displays a rough approximation of the waveform, and the program provides commands to mix files or string them together. Sound Recorder also performs some simple effects—plays a file backward, adds an echo, or doubles the playback speed, for instance.

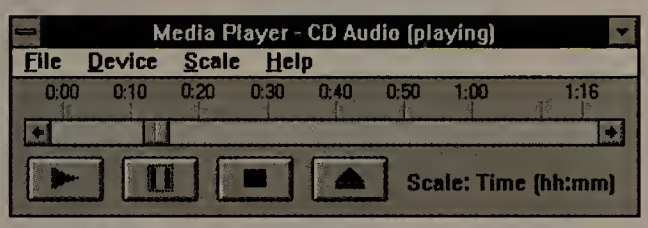
Sound Recorder is an Object Linking and Embedding (OLE) source application. OLE protocols embed one application's file into another OLE-supporting application. For example, you can embed a WAV file as an icon in a Word for Windows 2.0 or Ami Pro document. The user then clicks on the icon, and the file—a verbal note to accompany a memo to the boss, for instance—automatically plays back.

JUST ADD SOFTWARE

You won't experience the full multimedia benefits of Windows 3.1 until you install multimedia software that takes advantage of the features described here. Many programs are already available. Expect a surge of new titles now that Windows 3.1 has pushed multimedia into the mainstream. Windows is destined to become *the* operating environment for the next few years. Virtually all major software development these days is for Windows.

The upshot is that Windows 3.1 looks a lot like Windows 3.0, but the thousands of new bytes lurking behind the scenes promise to breathe new life into your properly equipped PC. M

John Walkenbach is a contributing editor for PC World *and* InfoWorld, *and a self-proclaimed MIDI addict.*



The Media Player application uses controls similar to those found on a home CD player. This simple application controls any MCI multimedia device that you've installed.

The Sound Recorder application records your own WAV files using a microphone attached to your sound board or it picks them up from an audio CD.

WHERE TO GET WINDOWS 3.1 DRIVERS

In the crunch to get Windows 3.1 out of Redmond on schedule, Microsoft did not include drivers for all the devices the program supports—and it supports a great number of displays, printers, sound cards, and other hardware. But Microsoft did the next best thing by developing a widely accessible Supplemental Driver Library. Twenty dollars gets you the latest version (call 800-426-9400 to order).

If you want to save a few bucks and get only the drivers you need, try contacting third-party vendors directly. For instant gratification, download. Many vendors have their own BBSs, and there are several other sources for Windows 3.1 drivers. Check the software libraries on any of the major online services.

Microsoft BBSs: The driver library is available on two bulletin board services operated by Microsoft: their Product Support BBS (206-637-8009) and the Microsoft Download Service (206-936-MSDL). Anyone can log onto these BBSs. Follow the instructions on screen to locate the driver you want.

CompuServe: You must have a CompuServe account. Log on as usual and type *go msl* to enter the Microsoft library area. The quickest way to find the appropriate driver is to do a keyword search for the driver you want. For example, the keyword *proaudio* takes you directly to the file for Media Vision's Pro AudioSpectrum board. The keyword *speaker* displays the file that contains the internal speaker driver. (These self-extracting compressed files have an EXE extension.) Execute either file at the DOS prompt to decompress it. You might find other goodies included. For example, the Pro AudioSpectrum file comes with two sound mixer applications that control the volume and tone of your sounds.

GEnie: You must have a GEnie account. Log on as usual, and enter *M505* to bring up a menu. Select the third menu item, Microsoft Library. This displays another menu, which you can search to find a keyword that describes the driver you need.

Microsoft planned to include a software driver to play sound through the PC's internal speaker—not exactly audiophile quality, but better than nothing for users who don't have a sound board. A few compatibility problems resulted in the driver being pulled from the final version of Windows 3.1. However, the driver is available if you'd like to try it out, although there are no guarantees that it will work with your particular system.

Install these Windows 3.1 drivers just like any other drivers, using the Drivers icon in the Control Panel. Select the option called Unlisted or Updated Driver, and specify the locations of the driver file and the OEMSETUP.INF file. Then restart Windows.

By Hans Fantel

from Rock *to* ROM

Computers are finding their voice. They used to be dumb creatures, signaling silently in alphanumeric symbols on the screen. But now, in the era of the MPC, they not only speak but sound forth with all the power of a great orchestra.

More and more, PCs are employed as part of a multimedia setup that involves audio as well as visual display. In short, music is becoming part of the computer scene. Some applications lean toward the wild side. For instance, at the University of Iowa, a talented computer has been taught to imitate the voice of Luciano Pavarotti (with a program named "Pavarobotti"); it gave a brief recital at the famous Juilliard School, "singing" operatic arias. But most MPC users have more modest aims. They just want good sound for their video games, to compose music via MIDI, or make music an interactive experience with the aid of CD-ROM.

The Quality of Sound

All this adds up to a new challenge for computer buffs: Upgrading the quality of sound. More than any other component, speakers determine what you hear.

Some computers come with built-in speakers. Forget those. Most of them are nasty little screamers, spewing out ragged sound that would curdle milk at 50 paces. That's not surprising. Those built-in speakers are designed to reproduce speech. The demands of music are beyond their ken.

Just what are those demands—and how can they be satisfied? Musical sound—as well as the sound effects in many computer games—requires three crucial performance factors: wide frequency range, adequate audio power, and low distortion. (Technical guidelines for these basic specs are spelled out in the "What's It All About, Audially?" sidebar.) In a sense, loudspeakers are musical instruments. They must sound off as vio-

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lins, trumpets, drums, flutes, or whatever musical fare is fed to them in the form of an electric signal. As a result, loudspeaker design is a tricky area of engineering where electronics, mechanics, and the ancient craft of musical instrument building overlap.

The trouble is that the flimsy speakers and puny circuits built into the computer are usually deficient as far as music is concerned. If you want musically convincing sound, you have to beef up your computer with outboard sound gear.

The easiest way to do this is with a speaker/amplifier combination specifically designed to function as a computer peripheral. Several models of this sort have recently been launched: Front runners include the Bose RoomMate Computer Monitor ($339/pair), the Acoustic Research Powered Partner 570 ($475/pair), and the Altec Lansing ACS300 ($400/three-piece system).

All three are highly compact—barely bigger than a lunch box. Each speaker contains its own amplifier as an integral unit, so all you have to do is plug it into your PC's audio card and the sound comes pouring out.

Normally, the sound of small speakers tends to be skimpy and rough. But these speaker/amplifier combos manage to pack surprisingly big, smooth sound into bantam boxes. It's done by a neat technical trick called "frequency contouring."

Big Sound from Small Packages

Because speakers and amplifiers are literally made for each other in these unified designs, the amplifier response can be adjusted to make up for the little speaker's reluctance to pump out lots of bass. Normally it takes a big object to emit deep sounds, which is why a double bass is bigger than a fiddle. But when combining the speaker and amplifier, the response curve of the amplifier can be fitted to that of the speaker much as a key fits a lock. One zigs where the other zags. This compensation by both speaker and amplifier evens out the deficiencies in frequency response. It's a sort of electronic shell-game by which clever engineers tweak the laws of nature.

The design of these speaker/amplifier combos also pays off in efficiency—that is, the volume of sound obtained from the rather limited wattage of the amplifier. As a result, these compact computer speakers bring out the best in the audio portion of computer games and similar applications. As for music, while they do well with jazz, pop, baroque, and orchestral music of a lighter texture, they fall short in projecting the impassioned outbursts of a full symphony orchestra or the more sonically demanding kinds of rock. Wagnerian thunder and heavy metal at full blast would almost certainly result in distorted sound from these speakers. But comparatively tame musicians, such as Wolfgang Mozart or Natalie Cole, come across fine.

The three self-powered MPC speakers mentioned are comparable in capabilities, but each has its specific strong points. For example, the Acoustic Research Powered Partner packs the most wallop. The 35 watts pushing each speaker make for punchy sound effects in computer games, and many kinds of music benefit from the bright timbre of the sound.

By contrast, the Bose RoomMate has a sweeter, more subdued sound that is extremely well suited to classical music since it brings out the natural warmth of string instruments.

Altec Lansing's ACS300 computer speaker system is the only model in this group consisting of three separate units. In addition to the two small speakers regularly placed alongside the computer, the ACS300 has an additional bass module (or sub-woofer) that can be placed under a desk or anywhere in the room. The extended bass response enlarges the sound with added depth and richness. What's more, the two small side speakers can be optimally placed, depending on their intended use. If only one person is working at the computer, the side speakers can be located next to the screen to produce intimate sound with a fine sense of immediacy. If many people

are listening, the speakers can be wall-mounted to project their sound throughout the room.

Not even their designers claim that these small computer add-ons challenge the sonic prowess of a full-fledged stereo sound system. If you value musical fidelity and often use your MPC for playing CD-ROMs' demanding musical programming, your best bet would be to hook your computer into a regular stereo system.

In setting up such a system, again the speakers are the most crucial choice.

Choosing Between Speakers

With so many diverse elements affecting their performance, it's no wonder that no two speakers sound quite alike. Each has its own tonal flavor, its own tone color. Some tend to be bright and brilliant, enticing every sonic detail with analytic precision. Such speakers add excitement to jazz, rock, and synthesizer sound. Other speakers—the minority these days—are notable for blending orchestral sound into coherent sonority, conveying the warmth and solidity of a massive score. But this particular virtue usually comes at the sacrifice of other characteristics such as crisp definition of tonal detail and dramatic bite.

It's impossible to say which kind of speaker is best. It depends on what you like. The trick is to test a lot of different speakers, preferably listening to them side by side. Pick one whose foibles happen to match your own tonal taste.

More Boom for the Buck

When comparing specs, you may find an $80 speaker and an $800 speaker claiming the same frequency response. In view of the substantial price difference, you ask yourself: Are the figures lying? Or are the liars figuring?

The answer is, a bit of both. Engineers, just like accountants, often find ways to make the figures look better than the facts. The specs may be true as stated, but that doesn't mean that the budget speaker really *sounds* like the more expensive model.

For instance, the specs may say that a speaker has a frequency response from 40 Hz to 20,000 Hz. All this tells you is the top and bottom notes the speaker can

Bonus: Fantel's Tips for Choosing Stereo Components

If you want a complete sound system to interface with your MPC, you'll need at least two more stereo components in addition to the speakers and receiver: a CD player (unless you already have a CD-ROM drive, which plays regular CDs) and a cassette deck.

In choosing a CD player, pick a model with the latest technological advance—a 1-bit decoder. The decoder in a CD player converts the stream of digital pulses into continuous waveforms that can be amplified to drive the loudspeakers.

The newly developed 1-bit principle enables relatively inexpensive decoders to achieve the same degree of fidelity that formerly was attainable only through much costlier methods. These decoders are largely responsible for making recent budget-priced CD players sound just about as good as far more expensive models.

Outstanding cases in point include the Technics SL-PG300 ($180), the Onkyo DX-720 ($230), the Yamaha CDX-450 ($249), and the JVC XL-V241TN ($200).

When gauging cassette recorders, there is a fast practical way to judge performance: Just put each through its paces.

Work all the controls and observe whether the tape starts and stops smoothly without jerking. Check whether the machine runs quietly, without vibration or whirring. Switch back and forth between rewind and fast forward and watch for any tendency to snap the tape.

The main thing, of course, is the sound. Bring one of your own discs to the shop and ask the salesperson to make a copy of it on the recorder you are testing. Then play the original and the dub side by side and see how close the copy gets to the original.

Keep in mind that no cassette recorder can fully capture the frequency and dynamic range of a CD. But a good one can come pretty close.

Outstanding budget models among cassette decks include the Denon DRM-510 ($250), the Pioneer CT-W250 ($210), and the Yamaha KX-30 ($299).

What's It All About, Audially?

Three main measurements define the performance of audio components: frequency response, power output, and distortion.

Frequency response tells the tonal range of the equipment. The audible range extends from 20 Hz to 20,000 Hz (or cycles per second), but except for the lowest notes of a great pipe organ, few musical sounds occur below 40 Hz. Frequency response extending down to 40 Hz is therefore adequate in loudspeakers.

Power output is the amount of energy the amplifier delivers to the loudspeakers. Contrary to popular belief, it does not directly relate to how loud the equipment can play, but to the loudness attainable within stated limits of distortion. A power output of 30 to 40 watts per channel suffices for most computer-based home applications. Only massive orchestral sound requires high power ratings.

Distortion is any change in the signal or the sound falsely introduced by faulty equipment—anything in the electronic chain of reproduction that makes the end result different from the original musical performance. High-quality amplifiers should have less than one percent distortion when operating at full output power, where distortion is likely to be greatest.

What to Listen for in Loudspeakers

If you want to judge the fine points of speaker performance, the best way is to listen to symphonic music. The orchestra creates a broad range of frequencies and the many different instruments provide a variety of sound textures. As you listen, be on the alert for these clues:

1. *Do the violins have a silky sheen of sound without harshness? This shows that the speaker has smooth treble response.*
2. *Is there solid weight in the sound of cello and contrabass? This is a test for bass projection.*
3. *Do drums or plucked strings sound sharp and crisp? This is a test for so-called transient response.*
4. *Does the sound stay clear and unblurred even in loud passages scored for full orchestra? This test reveals distortion.*

Any speaker passing muster on all four points is a good candidate.

squeeze out. It says nothing about the quality of sound, which depends mainly on how the speaker deals with all the notes in between.

In general, you can't really tell how a speaker will sound based on its specs. The only way to judge speakers is by listening—preferably in direct comparison with other speakers. (See the "What to Listen for in Loudspeakers" sidebar.)

There's good news for the budget-bound. The performance gap between inexpensive speakers and deluxe models is shrinking. Computer-aided research into basic acoustics has led to new design principles that bring the sound of smaller models closer to that of their larger and costlier counterparts.

To hear what budget speakers can do these days, listen to such well-priced standout models as the Boston Acoustics HD5, or the HD5v for the magnetically shielded model, ($150/pair), the Polk M3 ($199.90/pair), the B.I.C. Venturi V62 ($219/pair), and the Pinnacle PN 50 ($250/pair). Many listeners find speakers in this class entirely satisfy both their ears and their bank balances.

But if music is a serious passion, you may want to spring for a pair of speakers that put a bit more muscle into the sound. Top-ranked designs in the mid-price group include the KEF Q60 ($599/pair), the PSB 50MKII ($550/pair), and the Celestion 11 ($699/pair). Compared with lower cost designs, these speakers put out more bass, giving the music a sense of weight and warmth. They also tend to lend the highs a silent air quality that enhances the sense of musical presence.

Since none of these speakers contain their own amplifiers, you will need to obtain a separate unit to drive them. This unit may be either an amplifier or a receiver, which is an amplifier with a built-in radio tuner to pull in FM stereo and AM broadcasts. Receivers are by far the more popular choice and (because all the electronics eggs are put in a single basket) receivers usually represent better value.

Excellent budget-priced receivers include the Pioneer SX-2900 ($300), the Yamaha RX-350 ($239), the Technics SA-GX303 ($350), and the Denon DRA-345R ($280). Each of these receivers has sufficient power to fill an average-size living room with clear, undistorted sound at concert level.

A final tip: Avoid discount shops or department stores that sell sound equipment as a sideline. Head for a specialized audio dealer, where you can get competent explanations of specs and features on each model, and advice on how to interface the sound system with your PC. Incidentally, the prices quoted here are list prices. Most audio dealers sell the equipment for less. M

Hans Fantel is the audio critic for the New York Times.

For more information about products in this article, send in the Product Information card. The Editorial Index on page 240A-48 lists product numbers.

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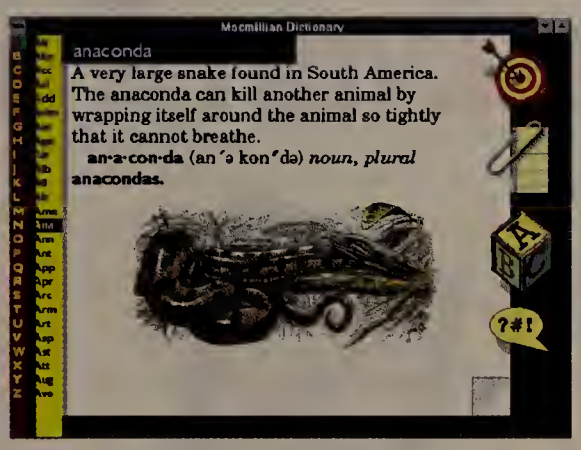

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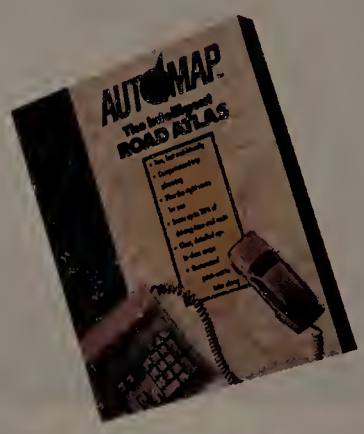

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Reviews

METROPOLIS NOW

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The two *Great Cities of the World* discs don't live up to their billing as multimedia travel guides, but they do provide a taste of different lands and cultures for the armchair traveler. Although the discs are packed with data, including minutiae such as restaurant prices and foreign consulate addresses, they lack information crucial to a traveler—such as detailed tips on appropriate dress and native foods.

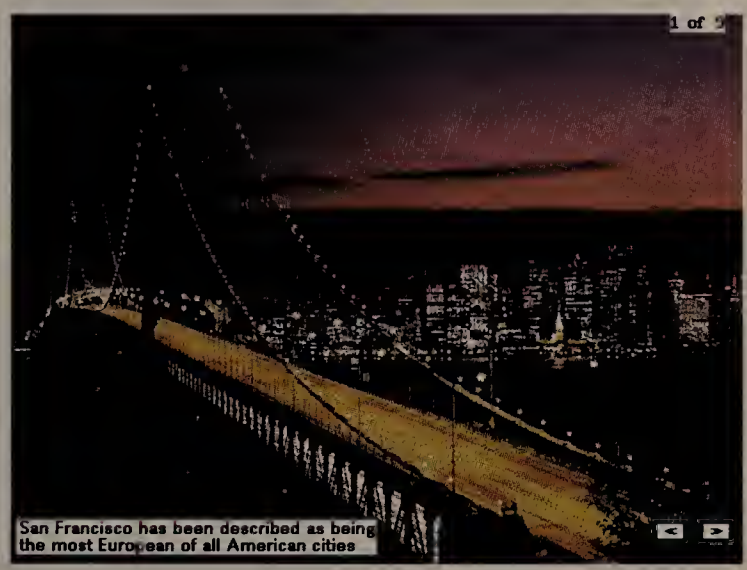
Volume 1 looks at Bombay, Cairo, London, Los Angeles, Moscow, New York, Paris, Rio de Janeiro, Sydney, and Tokyo. Volume 2 covers Berlin, Buenos Aires, Chicago, Jerusalem, Johannesburg, Rome, San Francisco, Seoul, Singapore, and Toronto.

While these discs aren't a traveler's best friend, students will find them useful for researching geographic or historic reports and essays. I learned quite a bit about cities such as Rome, Berlin, and Chicago, but your mileage will vary depending on how much you already know about a particular city.

SEEING THE SIGHTS

Both volumes install quickly and easily with their own setup applications. The program opens into a world map with oversized icons for that CD's cities; double-click on any city icon and you're off.

The main interface for touring each city is a 12-panel display, one panel for each of the program's main features: Fast Facts, Culture, Sights, Transport, Shopping, Entertainment, Recreation, Restaurants, Hotels, Travel Planner, Slide Show, and, for some reason, Quiz.



Each *Great Cities* slide show combines text and digitized narration with color photographs.

The program asks for your home country during setup; when exploring a city with a different language, a "Useful Phrases" section encourages you to learn practical terms. For example, when studying Rome, learn how to say in Italian such phrases as "I don't speak Italian" and "Where is the bathroom?" However, the recording of "ciao" is cut off so it sounds like "ow!" Also, loading each word is slow, and you have to wait for each to reload before replaying it.

I report primarily on the San Francisco entry here, because as a San Franciscan I can compare it against my own knowledge. The level of detail is similar in the other entries; my complaints about the San Francisco entry apply to the *Great Cities* discs as a whole.

I was disappointed to find the slide show had only 9 pictures of this photogenic town; most of the other cities' Slide Shows have 10 shots, although Singapore has 14. Three photos are night shots, obscuring detail on, for instance, the historic Embarcadero building. Music and narration perk up a brief but interesting introduction to the city and its history.

Clicking on the Sights panel got me a map of San Francisco, with a few "hot" spots that could be blown up with the magnifying glass tool—the pointer becomes a magnifying glass only over these areas. (Volume 1 doesn't have these "zoomable" neighborhood maps.) I zoomed in on North Beach, the Italian sector of town, and then the Coit Tower monument; the picture appeared on screen. A notice said to click to return to the map, but the program did so on its own after 15 seconds.

Next to the map are buttons for Museums, Parks & Gardens, Tours, and Landmarks.

Great Cities spotlights nine San Francisco landmarks, including the Golden Gate Bridge and the Transamerica Pyramid. (Most of the other cities have only seven landmarks shown.) Switching to the text option yields mini-essays of about 80 words on each of the choices. This has some good shots, but again, almost half are dark nighttime pictures. Each photo is accompanied by a sentence or two of narration. The bad news is each photo is preceded by a redundant dialog box that tells you to click a key to leave the photo; but you have to hit a key to leave this dialog box — every time.

Choosing the Tour listing produces a map of the entire San Francisco Bay Area. The names for larger cities such as Berkeley and Oakland look like hot buttons but aren't. The Alcatraz nameplate is,

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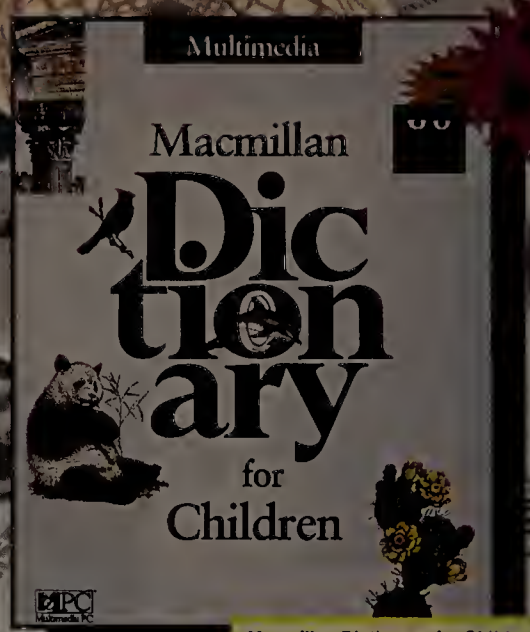

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Dept. MPC

however, and clicking it loads the same photo shown in the Landmarks section. Choosing to view the text gets you info on eight tours, from walking Chinatown to buzzing downtown in a helicopter.

The Park button brings up nine parks, and only Golden Gate Park rates a picture; each park gets 12 to 70 words of background information. Pressing the Museum button yields dozens of museums listings, but only addresses and phone numbers are provided.

At this point I encountered another flaw in the interface; I couldn't return directly to the 12-panel screen. I had to either click on the ubiquitous World button, start again at the beginning world map, and rechoose my city, or backtrack one screen at a time with the Return icon.

The Culture section opens with an essay from Conde Nast's *Traveler* that describes such San Francisco wonders as a homeless woman who shares her cheesecake recipe. Actually, this story could have introduced the entire city.

General Info provides a good breakdown of San Francisco's various neighborhoods. The History listing runs from Sir Francis Drake's discovery to the '89 earthquake. There are also entries for politics, religion, festivals, and holidays.

The Fast Facts section provides the most useful travel info: it gives consulate and embassy addresses and phone numbers, as well as data on time zones, currency, and climate. *Great Cities* would be more valuable if it gave some firsthand tips, such as don't wear shorts in San Francisco in summer—your legs turn blue, much to the natives' amusement.

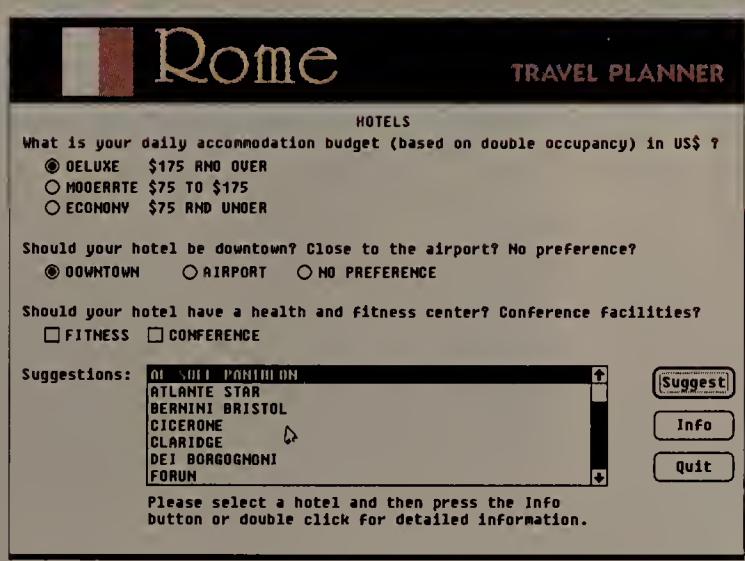
The Entertainment section gives a fairly wide spectrum of good places to try. At least the Paradise Lounge and Vesuvio's, my local club and favorite bar, are mentioned in the Nightlife listing, but South Beach Billiards, *MPC World*'s pool hall of choice, isn't listed.

The Arts entry has just two paragraphs; listing 24 theaters and 13 cinemas doesn't do justice to this city in which it seems everyone is an artist of some kind. There's also a five-paragraph bit on Spectator Sports, which doesn't mention the 49ers' back-to-back Super Bowl wins.

The Travel Planner looks like an ugly DOS application with jagged type, and that's strange in this otherwise glossy package. I clicked on Hotels and filled in my price range and the area of town I wanted. The list of lodgings that came up included prices and phone numbers. My low-cost choice had the comment "Just the basics. Nothing to write home about." When I upped my budget to include the famous Fairmont Hotel, the comments included a history of the building as well as its starring roll in the TV series "Hotel." Click on Restaurants to choose eateries the same way—by location and cost. Alas, my favorite Italian restaurant, Capp's Corner, was not listed.

Onscreen credits detract from a photograph illustrating San Francisco's contrasts.

Transport has subcategories for Air, Ship, Train, Car, and Taxi; this panel includes car rental agency listings and information on rail systems and airports. Recreation covers hang gliding, ballooning, cycling, boating, and other activities. Shopping tells where to buy antiques, and arts and crafts, and gives notes on fashion. The Travel Planner panel accesses the same data the Restaurants and Hotels panels do; the information looks better in the Restaurants and Hotels panels, with nicer fonts and such, but it's still scrollable lists without any efficient way of finding items.



The well-designed interface for *Great Cities* quickly accesses the disc's 12 features; the Travel Planner isn't snazzy, but features a good sorting engine for its database.

And there's the Quiz. These certainly aren't Questions You Must Be Able to Answer Before Having a Safe Trip in San Francisco. They're just a list of 20 trivia points, and when you click on the question, you get a not-quite-complete answer. For instance, in answer to the question "What's the name of SF's metro?" the answer is BART—with no mention of the Muni Metro.

DON'T LEAVE HOME WITHOUT IT?

If *Great Cities* really wants to be a city sampler, the databases of hotel, restaurant, and embassy listings should be junked in favor of more cultural or scenic informa-

tion. An introduction to specific cities and cultures doesn't need travel-planning features.

If *Great Cities* intends to be a thorough travel resource, it needs a complete, up-to-date database including timely and detailed information on accommodations, climate, appropriate dress and behavior, and transportation. Without the search and retrieval features of a database, CD-ROM guides aren't as useful as a language tape and a paperback travel guide with a good index—which provide more information for a third of the cost.

Great Cities doesn't make it as either a travel resource or a reference tool. But if you want an introduction to the world's metropolitan wonders, *Great Cities* is worth the trip.

—Paul Worthington

Great Cities of the World, Volumes 1 and 2
CD-ROM based. Requires MS DOS 3.1 or later, VGA and a mouse. DOS and MPC/Windows 3.1 versions available; Macintosh version in development. $79.95 each volume. **InterOptica Publishing Ltd., 300 Montgomery St., San Francisco, CA 94104, 415-788-8788, fax 415-788-8886.** Circle 1220 on product card.

KING'S QUEST V

The Sound and the Furry

It was like falling in love all over again with the same person. I have been looking at the fifth version of *King's Quest* since early 1990, when it was only design notes and a set of artists' sketches; I began playing it months before it was finished, and reached the point where familiarity bred boredom.

But playing the multimedia version of *KQ V* was a new experience—akin to interacting with an animated feature film. Like rediscovering an old lover, it was a sweet surprise. While I had rushed through extended scenes in the text-driven version, in the multimedia *KQ V* I settled back to enjoy and absorb the story. I felt genuinely sorry I knew the game so well; I would have loved to play this new *KQ V* with no knowledge of what would happen next. Sierra On-Line used multimedia to breathe new life into the game, adding great depth and dimension.

King's Quest V: Absence Makes the Heart Go Yonder! is the latest installment in the life and adventures of King Graham of Daventry and his family. (I know; the second part of the title is a little lame—that's probably why it's printed in such small type on the box.) The game was a smash hit when it was first released, and has sold strongly since.

Like all the other titles in the *King's Quest* series, *KQ V* is basically nonviolent. Death does occur, but this game isn't about killing your way out of problems. In fact, Sierra On-Line promotes the product as one the whole family can play, either individually or together.

King Graham prepares to enter his enemy's lair in the new CD-ROM–based version of the popular *King's Quest V* game.

Based on both content and ease of play, it succeeds. This is not a child's game, but children can play and enjoy it.

KQ V is best described as an animated cartoon with puzzles that must be solved to advance the story. As the player, you control the actions of King Graham as he searches for the wizard who kidnapped his family and castle. They're locked away in a bottle somewhere, threatened by a magician-turned-cat (who's not at all pleased with his condition). Other cast members include elves, desert bandits, shopkeepers, gypsies, harpies, a wicked witch, an Ice Queen, a mermaid, and the Ancient Mariner. There's even an uncredited appearance by Rumplestiltskin. To succeed in his quest, King Graham must travel from one end of the world to the other, through deserts and forests, across mountains and oceans, and survive the critters he meets along the way.

No more text boxes in the MPC version of *King's Quest V;* actors speak all the dialogue.

So, what do MPC and a CD-ROM contribute to the party? As in cartoons and animated movies, everything in adventure games revolves around a well-developed storyline. With standard floppy disk versions, getting into that storyline is almost like reading a well-illustrated book, as the dialogue and narration are conveyed with text on screen. But in the multimedia version, the characters talk, laugh, and cry. The actors' voices bring emotion to scenes, and sound effects create such a convincing environment that players feel they're a part of it: Ants sing their marching song, birds chitter, falling people scream. A well-synchronized musical score adds to the game's mood.

Just as a film differs from the novel on which it was based, the MPC/CD-ROM experience is fundamentally different from its floppy disk progenitor. Scenes play differently; the conversation between King Graham and Princess Cassima was a one-dimensional narrative exposition in the text-driven version; when actors read the scene, it's the personal tale of a young woman's suffering. Other characters also come to life: the Ice Queen thaws, revealing a formerly undetectable personality; the rat rescued by King Graham gains your sympathy instead of coming off as a bogus, cutesy character thrown in for the preadolescent set. Throughout the tale, the once-flat descriptions of people, objects, and scenery now unfold as part of a fable instead of simply telling players

how to proceed.

This translation does, unfortunately, bring out some of the weaknesses in the script of *King's Quest*. Passages that read fine silently sound stiff or flat when read by the narrator. This is especially true of descriptions that you hear a dozen times—when King Graham quenches his thirst in the desert, for example. This problem is one that all computer game publishers must face as they move to multimedia: Just as film or TV writing differs from a good novel, narration and dialogue in a game with sound must be scripted differently than text meant to be read by the player.

And then there's the acting. As a culture we mock bad acting, and *KQ V* has its share of it. Most, if not all, of the actors are amateurs; many are employees of Sierra On-Line. Roberta Williams, the game's author and designer, plays the rat; she's good. Some of the other folks should keep their day jobs.

Despite these flaws, the game-playing experience works remarkably well. The strong story and artistic technique easily compensate for the uneven quality of the acting and occasional flat dialogue.

Sound effects create such a convincing environment that players feel they're a part of it: Ants sing their marching song, birds chitter, falling people scream.

Installing this MPC version of *King's Quest* is a snap: Insert the CD and type *install*. The program asks about your sound card, video display, and a few other simple hardware matters. Except to name saved games, you don't type in *KQ V*; seven icons that appear at the top of the screen control everything. This interface is so simple, many hard-core players claim the game is too easy.

King's Quest V is an outstanding example of what animated computer adventure games can be; it proves that the potential and power of the multimedia game-playing experience is here today. It doesn't hurt that it's also a damn good game. ■

—Peter Spear

King's Quest V: Absence Makes the Heart Go Yonder !

CD-ROM based. Requires MPC (386 CPU and hard drive), DOS 5.0; 2 MB RAM; VGA with 640K of video RAM. Supports all major sound boards. $69.95.

Sierra On-Line, Inc., P.O. Box 485, Coarsegold, CA 93614, 209-683-4468, fax 209-683-3633.

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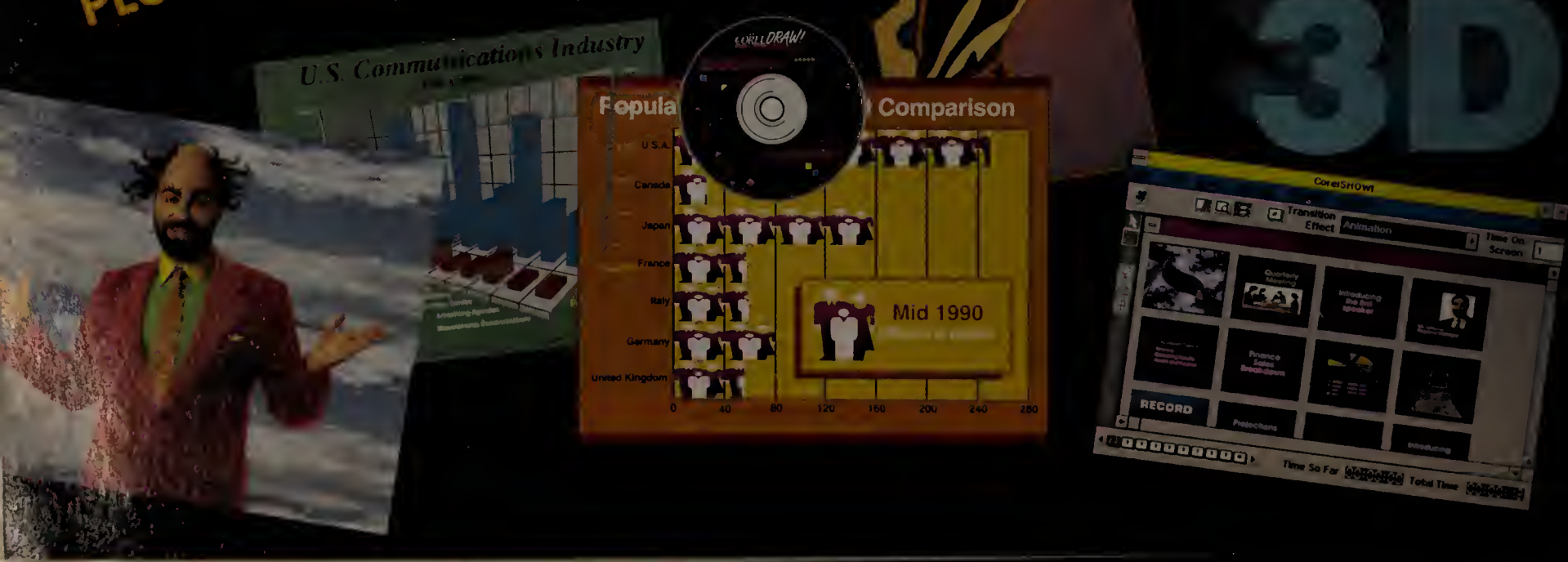

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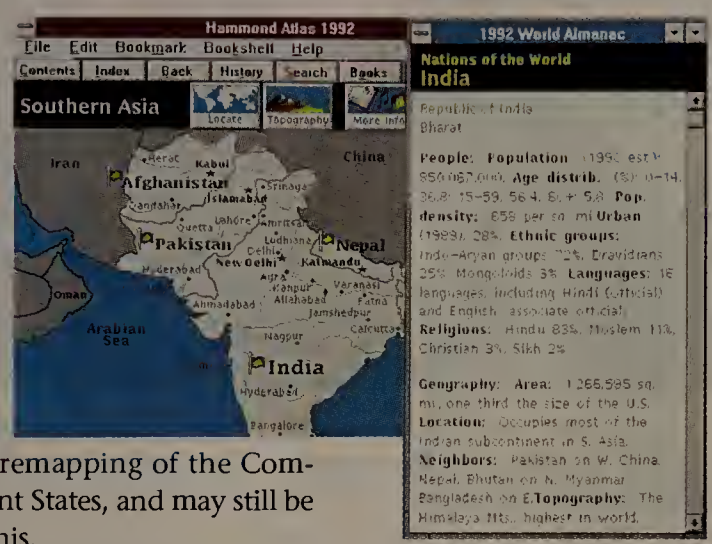
Circle 1096 on product card

By Paul Worthington

Sneaks Reference and Relativity

NEW WORLD ORDER



Reflecting a tumultuous year in world events and politics, over 500 new images fill the electronic pages of the 1992 edition of *Microsoft Bookshelf for Windows*. This new edition of the software company's $195 multimedia reference library incorporates the geopolitical remapping of the Commonwealth of Independent States, and may still be accurate when you read this.

New in this edition is the interconnectedness of the seven "books" that make up this virtual library; this new technology means users can access encyclopedia and almanac entries from within the atlas. Microsoft has also increased the number of animations to 40, double that of previous sets. And, in this version, one mouse click and you can hear every city in the atlas pronounced.

To make room on the CD for the new information, Microsoft did away with the narration used on the previous editions (usability studies found it wasn't needed). M

Microsoft Corp.
One Microsoft Way, Redmond, WA 98052-6399, 800-426-9400.
Circle 1215 on product card.

ISAAC'S INSIGHTS

Look up "Moon." You can jaunt from lunar astronauts to Newton pondering why the moon doesn't fall—and *hear* Neil Armstrong's original broadcast of his famous "One small step for man, one giant leap for mankind." The Science Adventure interactive book is part of the legacy of the late science and science fiction writer Isaac Asimov, who completed his work on the project just before his death. The floppy-based reference combines Dr. Asimov's writing with 300 color images and 60 sound files. Asimov covers mathematics, physics, technology, ecology, and life sciences in this appealing interactive science lesson.

As in Knowledge Adventure's first two works, each scientific image appears with both a timeline indicating its moment in history and a globe that displays the image's geographic context. The globe and timeline are hyperlinks for exploring related information. The $79.95 package is available now. M

Knowledge Adventure
4502 Dyer St., La Crescenta, CA 91214, 800-542-4240, 818-542-4200, fax 818-542-4205. Circle 1216 on product card.

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Enter the Pyramids of Egypt, navigate the Panama Canal, or climb the Great Wall of China in the first volume of *Great Wonders of the World* from InterOptica.

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The pyramids of Khufu, Khafre, and Menkaure at Giza.

With more than 40 minutes of video footage, 200 full-screen photos, 200 illustrations, 100 maps, as well as text charts, narration, and music, *Manmade Wonders* gives you a unique armchair view of humankind's greatest feats of engineering.

The $79.95 title will be available in MPC, DOS, and Macintosh versions, all scheduled for summer release. M

InterOptica Publishing Ltd.
300 Montgomery St.,
San Francisco, CA 94104,
415-788-8788, fax 415-788-8886.
Circle 1218 on product card.

TELLING TALL TALES

Two more famous children's tales come to the computer with EBook's beautifully illustrated electronic adaptations of *Peter and the Wolf* and *Beauty and the Beast*.

Actor Jack Lemmon provides the narration for the multimedia production of Sergey Prokofiev's *Peter and the Wolf*. The CD features a musical score performed by the Prague Festival Orchestra, with Pavel Urbanek conducting.

The *Beauty and the Beast* title has nothing to do with the popular Disney version; it's an original adaptation with all-new illustrations, a musical score, and an animated transformation at the story's end.

The EBook Multimedia Storybooks are designed for interactive reading or just listening to the stories' narrators. The illustrations can be explored by children as they search for hot spots that activate sounds or music; definitions for highlighted words are also provided. Both titles should be available now for $49.95 each. M

EBook, Inc.
1009 Pecten Court, Milpitas, CA 95035, 408-262-0502, fax 408-262-2345. Circle 1219 on product card.

VADER'S RAIDERS

Even though George Lucas says it'll be years before he makes the next *Star Wars* film trilogy, fans can get their fill of the Force in the new *X-Wing* game from LucasArts Entertainment Co. In this special-effects-filled adventure game based on the top-grossing science fiction films, players pilot Rebel Alliance starships against the evil TIE (twin-ion engine) fighters of the notorious Imperial fleet.

Before players can soar into battle, however, they have to pass muster in basic training at the Rebel Academy. As a final step toward graduation, they reenact many of the historic flights of earlier ace fighters for the Rebellion.

X-Wing, for IBM-compatible PCs, will be available near you in time for the holidays. Pricing was not set at press time. M

LucasArts Games
P.O. Box 10307, San Rafael, CA 94912, 415-721-3300, fax 415-721-3342. Circle 1217 on product card.

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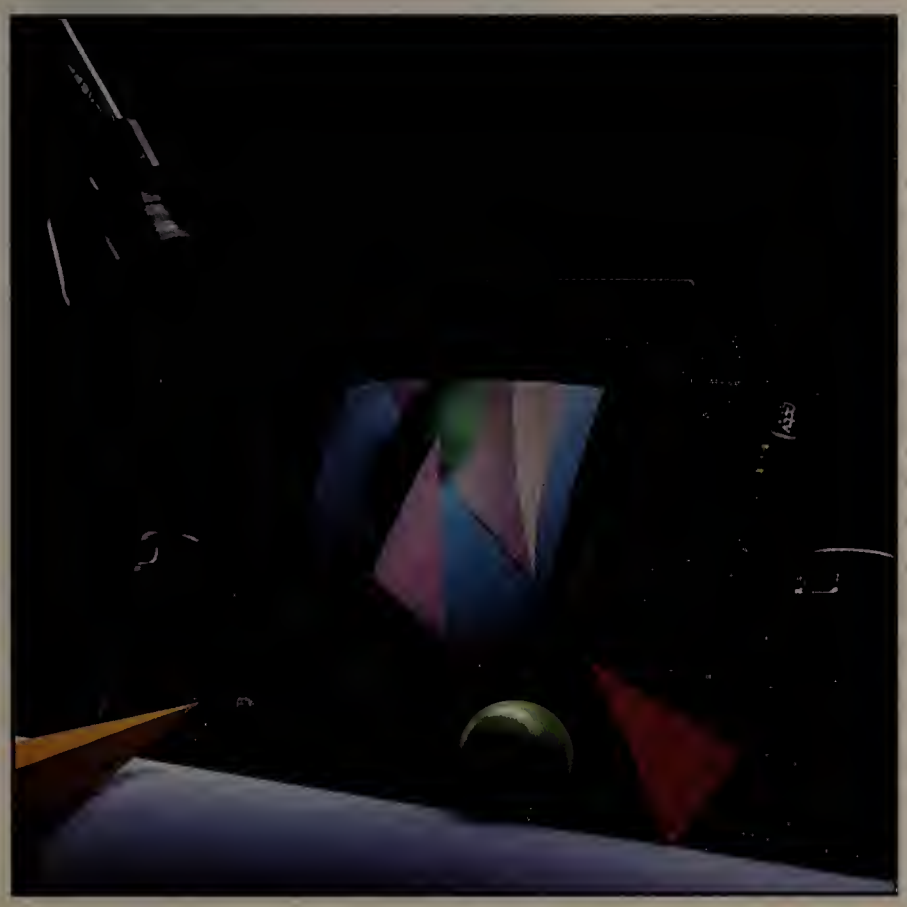

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Circle 1084 on product card

By Paul Worthington

TechnoLust Sound and Vision

No-Motion Video

The Xapshot is dead, long live the...the RC-570 Still Video Camera? Canon ditched the catchy name, but has improved this camera's quality and integrated it into a multimedia image capture and presentation sytem. The $3400 RC-570 records images directly from a VCR or other standard TV-signal source and provides point-and-shoot camera capabilities with a 3x power zoom lens, automatic flash, and infrared focusing system.

The camera plays back through a TV monitor and serves as a portable presentation device. It also comes with a remote control.

If you buy just the camera, you'll still need a video capture card to get images into your PC; companies such as Creative Labs offer these for less than $500. If you want to buy everything you need in one convenient package, Canon couples the RC-570 with its FV-540 drive for $6250. The drive reads and digitizes the 2-inch floppy video discs the camera records on and sends the computer-ready picture into a PC through an included SCSI card.

RC-570 Still Video Camera; SCSI Computer Imaging Set

$3400; $6250. **Canon USA Inc., One Canon Plaza, Lake Success, NY 11042, 516-488-6700 ext. 3359, fax 515-775-4717.** Circle 1201 on product card.

Takin' It to the Streets

If you need a movable multimedia system, take a look at NEC's portable MPC setup, which combines three NEC products into one take-it-all-with-you package. The primary component is the UltraLite SL/25C, which uses a 25-MHz 386 processor and an active-matrix color VGA display; its docking station has a full-size slot and a drive bay that accommodates the Sound Blaster Pro audio board included in NEC's multimedia upgrade kit. This kit comes with stereo headphones, a microphone, a pair of speakers, and NEC's double-speed CDR-83M CD-ROM drive. The $8287 bundle also includes Asymetrix's ToolBook multimedia authoring application.

NEC Portable Multimedia Solution

$8287. **NEC Technologies, Inc., 1414 Massachusetts Ave., Boxborough, MA 01719-2298, 800-388-8888, 508-264-8000.** Circle 1202 on product card.

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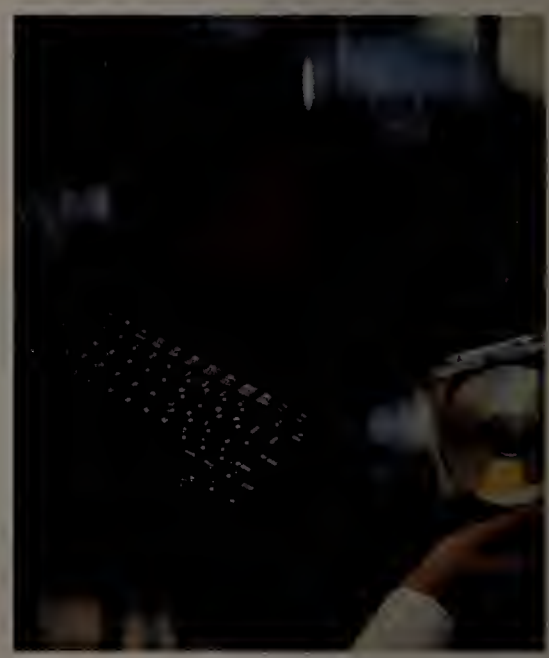

Want to study that CD-ROM copy of *Great Literature* while on your next trip? Multimedia or data-intensive CD-ROM work can be done anywhere with Grid's addition of an external CD-ROM drive to its notebook PC. The $6295 Gridcase 1550CD is no MPC (it doesn't have a sound card), but it does sport a built-in SCSI port for connecting the included drive, which has a 350ms access time. Because the drive isn't built into the unit, it can be left behind when not needed. Based on a 20-MHz 386SX CPU, the Gridcase includes 2 MB of RAM and a 120-MB hard drive, as well as a built-in Isopoint pointing device.

Gridcase 1550CD

$6295. **GRiD Systems Corp., 47211 Lakeview Blvd., Fremont, CA 94537-5003, 800-222-4743, 415-656-4700.** Circle 1203 on product card.

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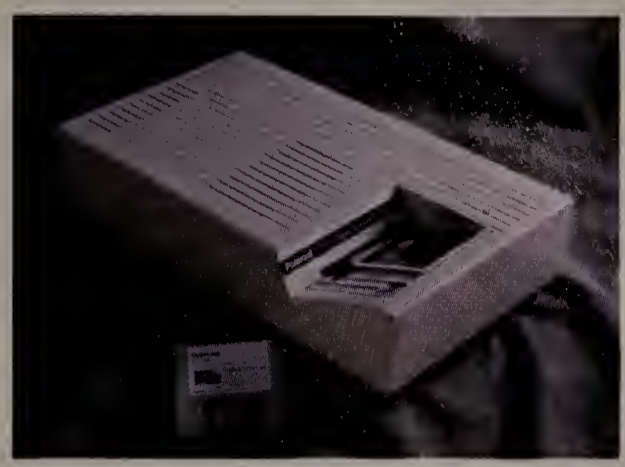

Polaroid's new photograph scanner offers a fast way to put snapshots into a multimedia presentation. The CS-500i digitizes a 4x6-inch photo into a 24-bit image in about 3 seconds at 125 dpi, or 12 seconds at its maximum resolution of 500 dpi. Polaroid incorporated extensive real-time image-correction capabilities into the scanner, resulting in a sharper image than other machines in its price range can produce. Speed and color quality are impressive, but the scanner's inability to accommodate a book or any picture larger than 4x6 inches could be a fatal limitation. A book of photos can be laid on a flatbed scanner but won't run through this machine's rollers.

CS-500i

$4495. Polaroid Corp., 575 Technology Square, Cambridge, MA 02139, 800-225-1618, 617-577-2000. Circle 1204 on product card.

The Mouse That Typed

Look, up in the sky! It's a mouse, no, it's a keyboard—it's the Twiddler! If you want to lean back in your easy chair instead of crouching over a keyboard, this input alternative might fit the bill. The Twiddler's not QWERTY, but ergonomically it may be even better. You can "chord" the 12 finger keys and 6 thumb keys for the equivalent of a standard 102 keyboard; pushing one or more keys at the same time generates unique characters, commands, or words. Handykey claims users can master the new method in about ten days and type up to 30 words per minute.

The Twiddler has a sealed, dirt-proof sensor on top that lets it work like a mouse, and it even has a joystick mode for playing games. A supplied "Y" cable connects both the Twiddler and a keyboard to a PC.

Twiddler

$199. Handykey Corp., 141 Mount Sinai Ave., Mount Sinai, NY 11766, 516-474-4405, fax 516-474-3760. Circle 1207 on product card.

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It's the *Jetsons'* computerized home in a box; this out-of-the-ordinary MPC does everything but the dishes. Acer's first MPC—sold as the AcerPAC 150 and under the company's home-market label as the Acros 380—includes such consumer electronics flourishes as a telephone answering machine, fax machine, audio CD player, AM-FM radio, and speaker phone functions. You don't have to leave the computer on 24 hours a day to get the phone; Acer's StartSmart system boots up the machine in seconds to answer an incoming phone call or fax and powers down when the call is handled.

The system records and plays back phone messages as standard digital WAV files, which you can save and use in other applications. It sports front-mounted volume controls, and all the home electronics touches are controlled through a software graphic interface that resembles a home stereo system and an answering machine. The MPC is based on a 386SX processor and comes with 4 MB of RAM, a 130-MB hard drive, and super-VGA display output. The MPC has a standard stereo sound card with a MIDI interface and a CD-ROM drive with a 600ms access time. Bundled software includes Microsoft's *Works, Bookshelf,* and *Entertainment Package.*

AcerPAC 150, Acros 380

$2399. Acer America Corp., 2641 Orchard Parkway, San Jose, CA 95134, 408-432-6200, fax 408-432-6221. Circle 1205 on product card.

(Continued on page 240A-58)

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Circle 1089 on product card

By Warren Sirota

Audio Clipping Right Along

Spiff Up Any Multimedia Project with CD-ROM–Based Clip Music

Music and sound help give multimedia productions their emotional and dramatic impact. Because many multimedia creators don't have the time or budget to compose their own music and sound effects, they use clip music, which has evolved to resemble the more expensive production libraries used in broadcast applications. Production libraries have been around for many years. They are especially useful to TV and radio ad producers—it's a cinch that a local supermarket isn't going to hire a symphony orchestra for a radio spot.

When you purchase clip music, you are buying a license to use it. The precise terms of usage—whether the clip can be used for broadcast, for instance—are spelled out in the agreements that accompany each package.

Multimedia = Multiple Formats

Sound for multimedia comes in three formats: CD audio, wave audio, and MIDI (see "The Shape of Sounds to Come" in Media Lab, April/May 1992, for explanations of these formats). The products in this column run the gamut.

Multi Media Music from Killer Tracks is an audio CD just like the ones you play on your stereo except it's designed and licensed for multimedia use. ClipMedia from Macromedia has tracks licensed from Killer Tracks, as well as wave format sound effects and a large selection of animation, digitized video, and graphics files. MusiClips from Voyetra is a collection of MIDI files on floppy disks, and MusicBytes from Prosonus combines all three formats on a CD.

Before deciding which sound format to use in a multimedia project, consider your distribution requirements. With CD audio, you can play your presentation back only when the CD is in the drive; you need multiple copies of the CD if you want your project to be installed in several places. Wave sound is more transportable because it can be played from hard disks. However, MPC owners can use their sound boards to convert the CD audio tracks to waveform. It is sampled in a format appropriate to the source material—from 11-KHz mono for voice and some sound effects to 22-KHz stereo for high-quality music playback and fancy effects. (CD audio, on the other hand, is 44-KHz stereo.)

MIDI sound is the most compact of the three formats, but it is a different animal in many ways. MIDI files are essentially like piano rolls for synthesizers, with recorded instructions instead of sounds. Consequently, a MIDI file sounds different on different systems because the quality of the sound card installed in the computer or the external synthesizer affects the output. MIDI allows musical sequences to be manipulated, rearranged, transposed, made faster or slower, and printed as musical notation. MIDI format is ideal when users need the ability to manipulate sounds.

The MIDI files in the products mentioned in this column are set up for the MPC spec, which means that each file contains two separate orchestrations: general MIDI base-level sound modules (which is what most internal sound cards are) and more elaborate arrangements for general MIDI extended-level devices. General MIDI is a standard mapping of instrument sounds to MIDI code. The folks at Voyetra have done the best job on the base-level arrangements; they've kept the percussion and sound choices in MusiClips fairly simple. By comparison, the more elaborate percussion tracks in

ClipMedia

CD-ROM based. Requires DOS or Windows, 286, 2 MB RAM, sound board. $395 for audio tracks, sound effects, and a graphics and animation library. **Macromedia, 275 Shoreline Dr., 4th floor, Redwood City, CA 94065, 415-595-3101, fax 415-595-3077.** For more information, circle 1208 on product card.

Multi Media Music

CD-ROM based. Requires DOS or Windows, 286, sound board. $300 per CD (approximately 30 audio tracks plus effects); $800 for all three CDs. **Killer Tracks, 6534 Sunset Blvd., Hollywood, CA 90028, 213-957-4455, fax 213-957-4470.** Circle 1209 on product card.

MusicBytes, Volume I

CD-ROM based. Requires Windows, 286, 2 MB RAM, sound board. $149.95 for 27 tracks in all formats and 107 sound effects. **Prosonus, 11126 Weddington St., North Hollywood, CA 91601, 800-999-6191, fax 818-766-6098.** Circle 1210 on product card.

MusiClips

Floppy based. Requires DOS or Windows, 286, 512K RAM. $69.95 per group (approximately 50 MIDI files), $149.95 for Collector's Edition bundle (three groups). **Voyetra Technologies, 333 Fifth Ave., Pelham, NY 10803, 800-233-9377, 914-738-4500, fax 914-738-6946.** Circle 1211 on product card.

some of MusicBytes' arrangements don't sound that great on a base-level synthesizer, but fare better with a more advanced sound module.

A Con-Chord-Ance

MusicBytes contains 27 tracks of varied, top-notch music replicated in all three formats, plus 107 sound effects in CD audio and wave format. The clips range in length from 5-second tags to 60-second vignettes, and the music—arranged and performed by first-rate studio musicians—is truly exciting. The arrangements are hip and sassy, with lots of funky numbers, hot guitar licks, and unexpected twists and turns. Styles range from bluegrass to jazz to urban rock. And each cut is convincing. The wave files contain some fun percussive elements, but they don't stand out the way the music cuts do.

Multi Media Music consists of three CDs: Training, Education, and Sales. As with MusicBytes, musical production values are state of the art. The pieces on each CD run from 30 seconds to 2.5 minutes, including a number of "urban contemporary" pieces (think of the "L.A. Law" theme) and a few pieces that evoke anticipation and nostalgia (imagine driving across the country through the mountains to start a new life—it's *something* like that). Each CD also includes about 30 sound effects and such production effects as fades, wipes, and bridges.

ClipMedia from Macromedia doesn't contain MIDI files or CD audio, but it does include well-organized and interesting wave audio (and, as a plus, many graphics and animation files). Most of the music clips are about 30 seconds in length, and the sound effects average 8 seconds each. The effects in this package are impressive, and the stereo is well implemented, particularly in the amusement park effects. The roller coaster sounds are great.

Voyetra's MusiClips is a compilation of MIDI files set up for an internal sound card or any general MIDI sequencer. *Collector's Edition Group 1* is a good choice if you're looking for recognizable music; it contains favorite children's songs, folk songs, religious themes, and holiday songs. Other editions contain arrangements of public-domain material and original tunes styled after familiar melodies, such as "Louie, Louie"; "Mercy, Mercy, Mercy"; "Light My Fire"; and "A Whiter Shade of Pale." (Naming them could make for a good parlor game.) These are solid, fun, rocking arrangements. *Collector's Edition Group 3* contains a special set of drum arrangements you can use to back up your own tunes.

While all of these are high quality, there is no single best package of clip music; your best bet is to select the package that meets most of your needs. If no one package does, consider mixing and matching for optimum flexibility. M

Warren Sirota is a composer, guitarist, and music technologist. He is president of Digital Arts & Sciences, publisher of MIDI Guitarist *magazine.*

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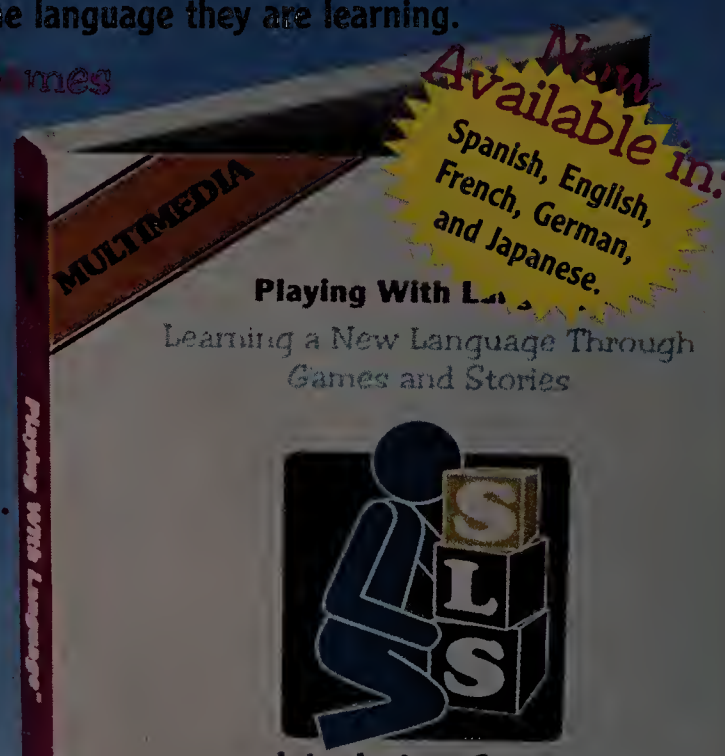
System Requirements:
An MPC system or a PC with Windows 3.1 and an audio board and CD-ROM drive that are Windows-compatible.

Recommended for ages 4 & above



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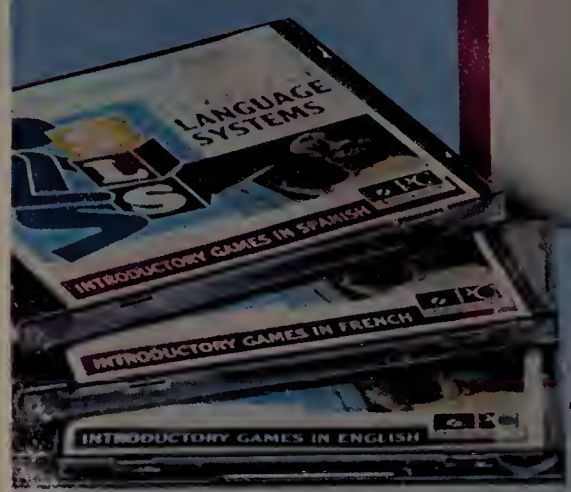

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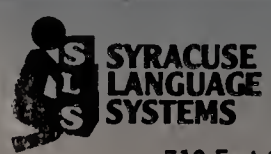

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What you need to know

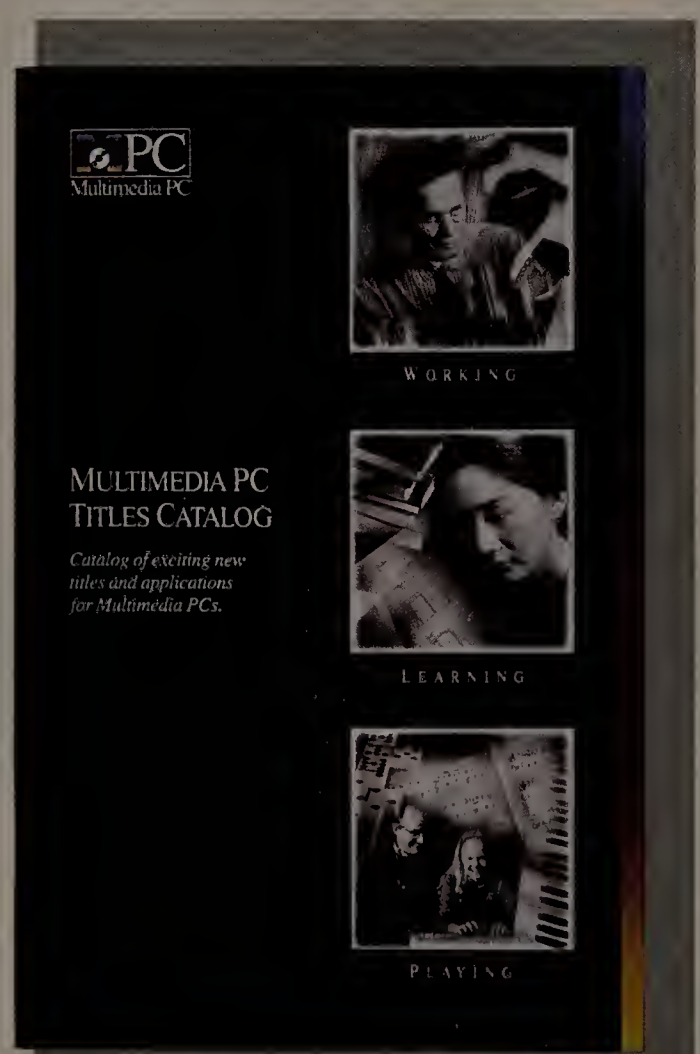
Multimedia PC Computing

Multimedia PC computing is not just a vision for the future. It is here today. Multimedia computing is simple: the integration of sound, animation, and photo-quality images with text and graphics. Yet, this simple idea will have a remarkable impact on the way people use computers.

The Multimedia PC Marketing Council has developed a standard multimedia computer specification: the Multimedia PC. The MPC trademark was established to encourage the use of a standard multimedia computing platform. The appearance of the logo on computer systems or upgrade kits guarantees that the hardware meets the MPC specification. End-users can be assured that software bearing the MPC mark will work on any MPC licensed system or upgrade kit. By establishing a standard platform, and by guaranteeing "plug and play" simplicity for the consumer, the Council encourages widespread use of multimedia applications and hardware. The MPC trademark is owned by the Multimedia PC Marketing Council, Inc.

Based on the standard desktop PC already used by millions, the Multimedia PC provides users with an affordable approach to multimedia computing that preserves their investments in PC software and hardware. The Multimedia PC also takes advantage of the Microsoft® Windows™ graphical environment, making Multimedia PC software easy to access and integrate with other software applications on your PC.

The list of Multimedia PC software products already includes more than 100 titles and applications from over 50 software companies. Multimedia PC titles include whole reference libraries brought to life with photos, drawings, animation, and sound; language-instruction titles with spoken lessons and pronunciations; interactive children's titles with engaging animation and sounds; and tools to help you build your own multimedia creations. Multimedia functionality is also migrating into application programs, bringing multimedia capabilities to word processors, spreadsheets, and other popular productivity software.



For a free Multimedia PC software titles catalog and information on how to contact the vendors mentioned in this article, please circle reader response #56

Multimedia PC's – The Basics

A Multimedia PC consists of these basic components: a PC, a CD-ROM drive, an audio board, and an operating system environment.

The *minimum* PC configuration for a Multimedia PC is a machine with a 386SX processor and 2 megabytes of RAM, a 30 megabyte hard disk, and a VGA or VGA+ display. (More powerful base configurations are also supported.) To this base a CD-ROM drive has been added, to give the Multimedia PC its tremendous information retrieval capabilities. The addition of an advanced audio board and speakers or headphones gives the Multimedia PC its ability to play and manipulate speech, music, and other sounds. The operating systems that currently comply with the Multimedia PC specifications are Windows 3.1 and Windows 3.0 with Multimedia Extensions.

You may purchase a Multimedia PC as a pre-configured system. Alternatively, if your PC meets the minimum system requirements, you can easily expand it to Multimedia PC functionality with a Multimedia PC upgrade kit. A Multimedia PC upgrade kit includes a CD-ROM drive, audio board and any software necessary to meet the Multimedia PC specifications. It can be used either as an enhancement of your current machine or to configure a new system.

Some common questions...

Is there a risk in assuming that hardware systems or upgrade kits that are advertised as "MPC compatible," but do not bear the MPC trademark, will provide full Multimedia PC functionality?

Yes, there is a risk. Although such systems may work well, without the MPC trademark on the package you cannot be sure that the vendor has fully complied with the Multimedia PC specifications. Vendors displaying the trademark are subject to independent testing

Look for this logo on all Multimedia PC hardware and software.

to verify adherence to these specifications.

Will a Multimedia PC slow down my computer or interfere with my current software?

No, the Multimedia PC is intended to protect your software investment and will not place an additional burden on your computer in running your existing software applications.

Do I need the Multimedia Extensions to Windows to run Multimedia PC software? Where do I get the extensions?

Windows 3.1 is all you need to run Multimedia PC software. The extensions are not built into Windows 3.0, however, so the addition of this system software, which comes bundled with Multimedia PC systems and upgrade kits, is necessary.

Look for the distinctive MPC trademark on systems and upgrade kits from these fine companies:

ACS Computer PTE, LTD.
Advanced Logic Research, Inc. (ALR)
Aztech Systems PTE, LTD.
Brysis Data, Inc.
CompuAdd Corporation
Creative Labs
Fujitsu Limited
ING. C.OLIVETTI & C.
Media Resources
Media Vision
Mind Computer Products
NCR
NEC Technologies, Inc.
Philips Consumer Electronics Company
Procom Technology
Tandy Corporation
Technology Integrated Products, Inc.
Turtle Beach Systems
Zenith Data Systems

Can I install the Multimedia PC upgrade kit myself?

Yes, upgrade kits are designed for installation by the user. Upgrade installation requires opening your PC and inserting an audio board into one of the PC's expansion slots, as well as installing an internal, external, or portable CD-ROM drive and loading the necessary system software.

How many expansion slots does a Multimedia PC upgrade kit require?

A Multimedia PC upgrade kit requires one or two slots, depending on the kit manufacturer and whether you select an internal or external CD-ROM drive. A number of upgrade kits with external CD-ROM drives require two expansion slots in your computer. Some upgrade kits offer an integrated audio board and internal CD-ROM drive that occupy only one expansion slot.

I already own a CD-ROM drive — can I use it with a Multimedia PC?

Perhaps. Upgrade kit manufacturers offer special packages that allow you to upgrade to a Multimedia PC without buying a new CD-ROM drive. However, CD-ROM drives come in a variety of performance levels, not all of which are sufficient for a Multimedia PC. To be fully compatible with the Multimedia PC standard, the drive must be capable of a sustained transfer rate of 150K per second and a maximum seek time of 1 second, and utilize no more than 40 percent of the computer's CPU processing power. This information should be included in the technical specifications for your drive. If it is not, check with your drive's manufacturer. In addition, you need to be sure that you are using Microsoft MS-DOS® CD-ROM Extensions (MSCDEX) version 2.2 or later and an updated device driver for your CD-ROM drive. The manufacturer of your CD-ROM drive can provide you with version 2.2 of MSCDEX and an appropriate driver.

I already have an audio board in my computer — can I use it with my Multimedia PC?

Some upgrade kit manufacturers offer special upgrade packages that allow you to use your current audio board. However, many popular audio boards are not fully Multimedia PC compatible. Multimedia PC audio compliance for digitized sound is 8 bit samples at an 11 kHz input sampling rate and 8 bit samples at a 22 kHz output sampling rate. Your audio board also requires a software driver from the audio board supplier to communicate with Windows. You can obtain this driver from your audio board manufacturer. The Multimedia PC also has audio mixing capabilities that enable it to output a variety of audio sources through a single output jack. Most older audio boards do not have this mixing capability but can be enhanced with external audio mixers that can be purchased separately. Check with your audio board manufacturer for more information.

Hardware and software vendors may call the Multimedia PC Marketing Council at (202) 331-0494 to learn about licensing the MPC trademark.

This information is provided as a service by the Multimedia PC Marketing Council, 1730 M St. NW, Suite 707, Washington D.C. 20036

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The following companies are among the growing list of software publishers producing titles for Multimedia PCs:

Access Software
Aimtech Corporation
Applied Optical Media Corporation
Aris Entertainment
Asymetrix Corporation
Authorware
Autodesk, Inc.
Bayware, Inc.
Bright Star Technology
Broderbund Software, Inc.
Bureau Development, Inc.
Compton's M.M. Publishing Group, Inc.
Context Systems, Inc.
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Dr. T's Music Software, Inc.
Dynamix
Ebook, Inc.
First Byte
Fourmat Corporation
Future Trends Software, Inc.
Gold Disk
Grolier Electonic Publishing, Inc.
HSC Software
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Killer Tracks
Knowledge Garden, Inc.
Lenel Systems International, Inc.
Macromedia, Inc.
Masque Publishing
Maxis
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Metatec
Microsoft Corporation
Midisoft Corporation
Music Pen, Inc.
Opcode Systems
Owl International
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Video

And Then There Was Video

By Steve Rosenthal

Tips for the new desktop video producer

Marshalling the extra hardware needed to create digitized video sequences is usually the hardest part of getting real-world moving images into a computer. But once you collect the appropriate equipment (see "Plug In, Turn On" in Media Lab, June/July 1992), capturing good digital video still requires a little time, a little skill, a little practice, and a lot of storage space.

Of course, the precise procedures you will use—and many of the trade-offs—vary with the characteristics of your specific video digitizer and any ancillary image compression hardware. Also, software support is just beginning to address the concerns of the desktop video producer. Even so, following some general principles when working with digital video can help you get better results across a wide range of products.

Set the Stage for Quality

Because all current desktop video solutions diminish the quality of the original image, you need to start with the best possible source material. If you begin with a badly lit scene or a low-quality VCR recording, by the time the image is digitized, compressed, and restored, it may look more like bubbling mud than professional video footage.

To address the limited dynamic signal range of most digitized formats, aim for a moderate contrast range. Good lighting is always important in video, but you'll improve your output if you avoid digitizing images that show people in front of brightly lit windows or that combine deep shade and bright sun, for instance.

If you're working with prerecorded video, remember that industrial or professional tape machines produce much better results than low-cost consumer gear. Professional formats such as Beta-Cam or 3/4-inch SP offer higher starting fidelity than VHS. And a machine with time-based correction (TBC) produces images with far less jumpiness.

Don't forget that many multimedia systems offer limited audio fidelity. Any background noise or limitation in the audio pickup is magnified when you play the recording back through the typical multimedia sound system. Attempting to "scrub" your audio requires expensive equipment and a lot of time-consuming, tedious work—and it still doesn't always produce a clearly audible result. The bottom line: Start with a clean signal.

Clean Up Your Act

Manipulating the bits that represent a digitized video signal on your computer is as easy as pulling up your latest spreadsheet. But the process of digitizing video involves firing up extra hardware, hooking up bunches of cables, and recording big files. Each step in digitizing your video increases the chance of crashing your hard disk.

Consequently, to be completely safe it's best always to precede your video digitizing sessions with a hard disk backup. Deleting unneeded files clears space for digitized images, and defragmenting your disk eases the task of packing away the digitized video sequences at high speed.

Naturally, the danger of a disk crash is highest when you first connect the video system, but system safety isn't guaranteed even after hours of operation. If you have a removable disk or other suitable backup system, you might want to save immediate backup copies of any digital files that required tricky setups.

Computerizing Video

Video signals in their original analog form are fragile tracings, ready to bend, shake, bounce, or hum at the smallest disturbance in their path or environment. The more connections and the

We've become accustomed to replacing stacks of paper documents with small electronic discs; video storage is almost exactly the opposite.

longer the cables, the less chance you'll get an accurate reproduction of the original imagery. Once a signal is converted to digital form, however, it's relatively hardy. Remember, the earlier you convert the signal to digital format, the better.

Does it matter which type of computer you use? At the production stage, a desktop system is definitely better than a portable. Because many video digitizer cards use chips that rival CPUs in complexity and power consumption, they throw off a great deal of heat. Even if your portable has the spare power and space to house an extra card, it probably can't withstand the heat generated by today's digitizer cards.

Video Storage

We've become accustomed to replacing stacks of paper documents with small electronic discs; video storage is almost exactly the opposite. To digitally store the information on a standard video tape, you might need a hard disk as large as 300 MB. Unless you have a cousin in the high-capacity disk drive business, it's best to use the PC only to record short clips and to store source footage temporarily for editing. Recording and storing long sequences is still best done on more traditional video equipment.

Check Results

In theory, if you set up your digitizer correctly and feed it the appropriate signals, you should get the correct results. But mixing video and computers brings out the uncertain nature in both systems. Each time you move or change your system, be sure to capture and view a few actual images before recording crucial footage. Otherwise, you might find that all your cables, connections, and software look right from the outside but your actual images look very wrong.

Following these tips doesn't guarantee good results, but it should increase the odds that you're happy with the final product. Whether you're a neophyte or an accomplished digital videographer, you'll feel better about your digital video endeavors if you're prepared to give them your best shot. ■

Steve Rosenthal, an author and video producer from Berkeley, California, regularly writes about multimedia for MPC World *and other publications.*

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Requires IBM PC, AT or compatible, 640K memory, hard drive, CD-ROM drive with MS-DOS extensions, DOS 3.3 or higher, Mouse (optional), VGA Monitor (2nd Edition only).

Circle 1098 on product card

Q & A

By Brett Glass

Q ..... *About 14 months ago I purchased a Sony CD-ROM drive. Recently I purchased two discs: Infoquest's* North American Indians *and* U.S. Civil War. *Both programs run, but neither shows the graphic photo sections. I spoke with a representative of the company who said the fault may lie in my new super-VGA Packard Bell PC. Someone else told me that it was the fault of my CD-ROM drive, that Sony has adopted a different "standard" since I purchased my unit. What's the story? Do I have to buy a new CD-ROM drive every year or so?*

Dr. George J. Doersam, Springfield, MA

A ..... According to Quanta Press, the publisher, Packard Bell's super-VGA card (which uses an Oak controller chip) is not fully compatible with other cards. The result: You cannot show the images at full resolution (640x480 with 256 colors). Quanta has found that the software will work in a lower-resolution (320x200x256) mode; to fully enjoy this and other titles, you may need to buy a different display card.

Q ..... *I purchased the Sony CDU 7205 CD-ROM drive with the Laser Library five months ago. I hooked it to my stereo and got phenomenal results. Thinking I had the equipment for a multimedia PC, I bought* Multimedia Beethoven *and was terribly disappointed when nothing worked except the audio presentation of the Ninth Symphony—no dialog, no examples, nothing! I immediately called my dealer who said I needed a "sound card" but could not tell me which one. I called Microsoft and got the same response. Sony told me, through a rather curt young man who seemed to think I was an idiot, that the Sony CDU 7205 was incompatible with Microsoft's Multimedia Extensions 1.0 as well as Windows 3.1, and that Sony was manufacturing its own card but didn't know when it would hit the market. Nobody else I talked to seems to know anything. Can you give me an answer in simple terms? All I want to know is whether I can ever get multimedia with the outfit I have.*

Jerome D. Valentine, Tamarac, FL

A ..... Unfortunately, many users have found that almost-new CD-ROM drives aren't capable of sustaining the 150K/sec data transfer rate required by the MPC specification. Fortunately for Sony Laser Library buyers, Media Vision has developed a specially tuned version of its Pro AudioSpectrum sound card that brings many older drives up to snuff; the CDU 7205 is one of the drives that can be coupled with this adapter to fulfill all the requirements for Level 1 multimedia. Contact Media Vision (800-845-5870) or your Sony dealer.

Q ..... *How much will a faster computer help multimedia performance? Isn't the bottleneck at the CD-ROM drive? Will more than 4 MB of RAM speed things up? Why are CD-ROMs so slooow? Does it have to do with mechanical limitations, or is it just adherence to the audio CD standard?*

David Pakalnis, San Antonio, TX

A ..... The main bottleneck in multimedia applications isn't always the CD-ROM drive. While CD-ROM access time can certainly slow things down, the graphics adapter is also a likely source of delays. Windows, in particular, takes a heavy toll on multimedia performance by consuming large amounts of RAM and acting as a slow "middleman" during graphics operations. The penalty is severe enough that some of the best games written for MPCs run directly from DOS rather than Windows. A faster CPU always helps; if you're using Windows, you probably need at least a 33-MHz 386—and working from a 486 will definitely speed things up. More RAM may help if you see a lot of hard disk activity, which indicates that Windows is swapping programs and data to and from the hard disk.

CD-ROM drives are slower than most other drives because of the fundamental limitations of the medium. The drive's motor must change speed as the head moves inward and outward on the disc—which takes extra time. And because the disc does not rotate very quickly, there's often a long wait before the data you need comes around to the read head. You're correct to blame the audio CD standard; had CD-ROMs been designed to use concentric tracks as hard disks do (rather than one long spiral track like a phonograph record) and to rotate the disk at a constant speed, they'd be much faster.

Q ..... *Recently I purchased the Sound Blaster version 1.5, and I really enjoy the great features it provides. A few days later, the Sound Blaster Pro came out and the ad stated "with full compliance to Microsoft Multimedia Level 1 Extensions to Windows and an interface to CD-Audio." Are those features necessary for multimedia? Does my Sound Blaster have the same capabilities? If those features are necessary and my Sound Blaster doesn't provide them, is there any way I can upgrade my Sound Blaster to a Sound Blaster Pro? It is really scary to buy something and find it's already out of date.*

James Wang, Cerritos, CA

A .....Unfortunately, even the manufacturer admits that the Sound Blaster version 1.5 isn't enough to make your PC meet the MPC specification. The most important omission: It lacks an on-board mixer, which you can't obtain separately for less than the cost of a Sound Blaster Pro. You may still be able to enjoy some MPC applications with the card you bought. Windows 3.1 comes with multimedia drivers that let you play digitized audio on an ordinary Sound Blaster, so if the programs you run don't require a CD-ROM (or if they don't require CD audio and digitized audio to be mixed), you may be in good shape.

Q ..... *I have a 386 system in a case that sits vertically on the floor, and I want to upgrade it to an MPC system. Can I install an internal CD-ROM drive and have it run properly in a vertical posi-*

tion? Will any or all CD-ROM drives work this way?

Daniel Stowell, Gainesville, FL

A ..... Many CD-ROM drives—particularly those without caddies—have to be horizontal. If you must use one in a vertical position, check with the manufacturer. For the widest choice of drives, get a drive in an external case. Besides solving the problem of how to mount the drive, this puts the drive on your desk within easy reach. Also, if it has a separate power supply, the drive puts less of a load on your PC's power supply.

Q ..... *I am hoping to purchase an MPC CD-ROM player with a multiple-CD cartridge holder, like many CD players have, that lets you put six CDs in one cartridge and directly select which CD you want to utilize. Is this available now from anyone?*

Mike Peery, Kilgore, TX

A ..... Pioneer's DRM-600A is a six-disc changer that, unfortunately, came in last in our speed tests. Its half-second access time is quite slow by today's standards, and it didn't achieve the minimum transfer rate required by the MPC specification. Pioneer promises a speedier version by the end of 1992.

Q ..... *When I play a CD-ROM sound track recorded at 11 KHz, it sounds fine, but when I try to play the same passage recorded at 22 KHz, it's chopped up. If I copy both recordings to my hard drive and play them back, they sound fine. Is this a function of the access time of the drive or the transfer rate of the interface card? I am using a Sony CDU-531 with an 8-bit interface card. The system is a 33-MHz 486DX with a Sound Blaster Pro.*

Bob Murdock, Bayville, NJ

A ..... One of two things is happening: Either your CD-ROM drive can't transfer data quickly enough, or the CD-ROM drive and the Sound Blaster Pro card together are monopolizing your system's bus. You may be able to solve the problem by getting a faster CD-ROM drive (yours is relatively old and doesn't meet the MPC specification) or a faster CD-ROM interface. A sound card with a faster interface (either a 16-bit card or one that uses a data transfer method other than direct memory access) may also help. Fortunately, most applications transfer waveform audio to the hard disk or to RAM before playing it, so this problem won't crop up under most conditions. M

Brett Glass is an electrical engineer, programmer, and industry analyst in Palo Alto, California. Brett answers technical questions about multimedia in each issue.

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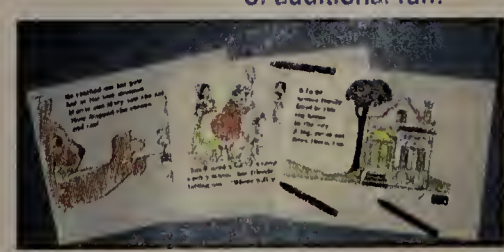

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Playing

By Corey Sandler

ON ANY GIVEN SUNDAY

KONAMI'S VIRTUAL FOOTBALL OUTRUNS AND OUTPASSES EVEN ITS OWN SUPER NFL SIMULATOR

I suppose I could learn to enjoy football if it weren't for the violence, the crummy weather, the boorish fans, and the obnoxious and overpaid players.

But I've learned an important lesson: It's not whether you win or lose—it's how you play the game. And my favorite way to play is from the climate-controlled comfort of my limited-access swivel chair.

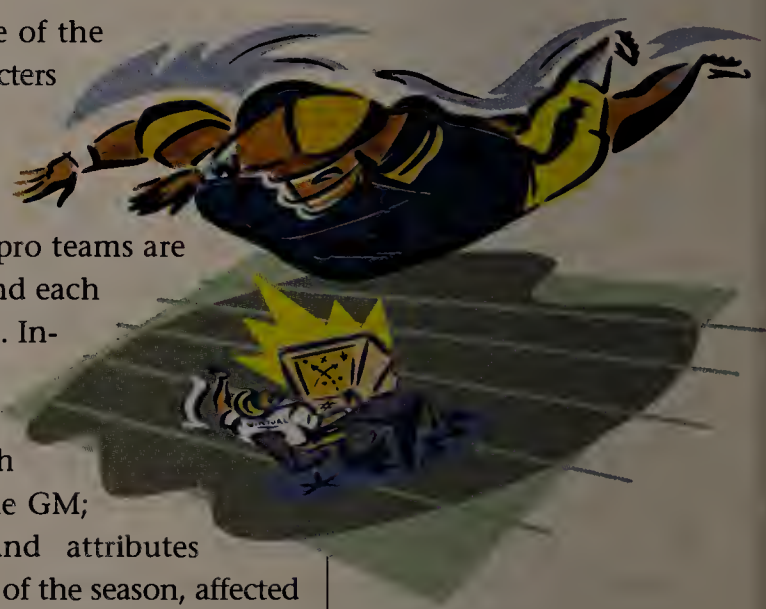
I've just taken the helm of a real National Football League team and led it to the Super Bowl. Along the way, I've glimpsed the multimedia future of sports simulation games. More about that later.

First, a look at an important new entrant on the market: I've been playing Konami's new *NFL* game. Konami is a major player in the video arcade marketplace; it's also a giant in the huge Nintendo industry and is making a move on the developing multimedia marketplace. In *NFL*, Konami has produced one of the most playable football simulation games yet.

As PC sports fans know, the world of PC games is more or less divided into statistics-oriented and play-action games. The stat-driven products are from the same school as flight simulators and military and historical re-creations; think of them as "what if?" spreadsheets of the gridiron, diamond, or boxing ring. This class of games allows you to act as a general manager, testing premises. For example, will your team perform better based on a squad of skinny but speedy track stars? Or will the path to the playoffs be cleared by a herd of steroid-bulked steers who can't run but also can't be moved?

The second type of PC sports game emphasizes the muscles in your fingers over the gray matter between your ears. In most cases, you directly control the quarterback on offense and the middle linebacker on defense.

Konami's *NFL* game is a mix of both. You are the General Manager and make all of the decisions—including drafting, trading, and making God-like alterations to the capabilities of your players. You take charge of the team and move the characters about.



NFL absolutely shines in the depth that lies behind the screen. All 28 pro teams are represented by name, and each has a roster of 45 players. Individual team members have ten player attributes and six vital statistics, each subject to change by the GM; team member stats and attributes change across the length of the season, affected by the outcome of the games. The computer ref has a rule book with an astounding 22 penalties.

The animation is very good; what is truly amazing is that all the players on screen are controlled independently by the computer. The linemen raise their elbows to block; the soccer-style field-goal kicker moves in on the tee convincingly. Also, a range of digitized sound effects and voices add depth.

Although you see the names and uniforms of real NFL teams, the players within the game are all fictitious (albeit modeled after players on the real teams). This game is licensed by the NFL itself and not by the players' association; paying two licensing fees was too large a pill to swallow, even for Konami. However, if—and this is a gigantic and exciting "if"—if you have the time and the inclination, you can use the editing features of the game to enter stats and attributes and even change the names of the players to your favorite pros of the present season or years past.

Edit the game to clone your favorite players of the present season or years past.

Now, back to the future—and remember you read it here first: Konami is preparing to let loose on the computer playing fields of America a fantastic new multimedia football game.

NFL Video Master, the working title of a new game being developed for Konami by Park Place

MATT FOSTER

Productions, will use digitized video footage from the NFL Film Library. You'll be able to select from something like 200 plays, set the ball in motion, and then watch the X's and O's on one screen and video images on another. The digitized video will be black and white, which saves space, gains speed, and lets you sidestep the problem of different uniform colors for each team.

But wait: Virtual reality comes closer as you play an entire season. A week of football happens simultaneously; as you play, video highlights of other games appear as updates. If they seem more interesting, or if you just like bouncing from one coach's job to another, you can take charge of other games in progress with the click of a mouse.

NFL Video Master is without a doubt unique; it's also gigantic. Developers wonder if the product can be held below 20 MB. Its size raises the question of why this game is designed for use on a hard disk rather than a CD-ROM. The answer: economics and market share, of course.

I spoke with Gordon Walton, a development manager at Konami. Walton was formerly with Three Sixty Pacific Software, where he was responsible for the successful *Harpoon* game.

"It's clear to Konami that we're going to do multimedia, on MPC and other platforms," Walton said. "I personally think the delivery medium will be CD on all platforms within three to four years."

One development that will spur the multimedia industry is the forthcoming CD-ROM player for the Super Nintendo system; that system, with a rumored list price of $200, is expected early in 1993.

"Nintendo will overcome the inertia against adopting a new technology," Walton said. "Cartridges, video arcades, and PCs are all getting more powerful, able to do things we thought unthinkable five years ago. I'm not sure they are converging in terms of abilities, but the delivery medium will converge. You can make a CD cheaper than you can a ROM chip or five disks."

The ultimate sports simulation game, as I see it, will include digital representations of players, coaches, playing fields, weather conditions, and all the other variables of the game. It'll play out on your high-resolution video screen and through your stereo speakers. And, it'll even simulate your seat between the fan on your left drinking beer through tubes connected to his hat and the over-friendly garlic farmer on your right. ■

Corey Sandler's home town team, the Nantucket Whalers, keeps losing its football in the fog.

NFL

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August 1992 **This card expires Dec. 17, 1992**

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August 1992 **This card expires Dec. 17, 1992**

A. Do you plan to purchase multimedia products for personal use or resale? (Check all that apply.)

- ☐ 01 personal use
- ☐ 02 resale

B. Which of the following PC hardware and/or peripherals do you have, or plan to buy for your PC in the next 12 months? (Check all that apply.)

- ☐ 03 Sound board
- ☐ 04 CD-ROM drive
- ☐ 05 Video board
- ☐ 06 Multimedia upgrade kit for existing PC
- ☐ 07 New multimedia computer system
- ☐ 08 Additional input devices (mouse, joystick, tablet, etc)
- ☐ 09 Modem
- ☐ 10 Printer
- ☐ 11 Monitor
- ☐ 12 Other hardware _____

C. Which of the following PC software products (disk or CD-ROM) do you have, or plan to buy for your PC in the next 12 months? (Check all that apply.)

- ☐ 13 Educational/reference sw
- ☐ 14 Entertainment/games sw
- ☐ 15 Creativity sw (art, music, multimedia authoring, etc)
- ☐ 16 Business applications sw
- ☐ 17 Home finance/mgmnt sw
- ☐ 18 Any Windows sw
- ☐ 19 On-line services
- ☐ 20 Other software _____

D. When do you plan to buy multimedia-related products?

- ☐ 21 immediately
- ☐ 22 within 3 months
- ☐ 23 within 12 months

E. Where do you plan to use multimedia personal computer(s)? (Check all that apply.)

- ☐ 24 home
- ☐ 25 work
- ☐ 26 school

F. Please indicate your total annual household income:

- ☐ 27 Under $25,000
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Circle 1083 on product card

Logging On

By Jon Carroll

DO-IT-YOURSELF UNIVERSE

Log onto microMUSE, buy a house, and start creating galaxies

If you want to drive yourself nuts, you could spend some time considering how "real" Cyberion City is. Is it as real as Springfield, Ohio; or as real as the Springfield where Bart Simpson lives; or as real as the vast underground cave in the original *Adventure* game; or as real as the cave where Injun Joe trapped Tom Sawyer?

Virtual reality is no longer enough. Now you have to ask: How virtual? Which reality? It's often said that the future of multimedia is graphics; it used to be said that the future of communications was picturephones. The imagination is a big screen; it has lots of bells and whistles.

Cyberion City is located in the mind of the user, in orbit around Earth, or in a computer in Massachusetts, depending on which reality you've selected from our fine menu. Cyberion City is a space station, carefully mapped in arcs and sectors, with a transportation system running along its spine. There are public and private areas; once a user becomes a citizen, the user gets a house. There are 6000 "rooms" in Cyberion City and 47,000 "objects," with space for perhaps twice that many.

At another level of abstraction, Cyberion City is a MUSE (Multiuser Simulation Environment). MUSEs grew out of MUDs (Multiuser Dungeons), which are (to vastly oversimplify) text-based group-hallucination online D&D games.

MUDs are a little programmable; MUSEs are a lot programmable. That's the point of MUSEs: Each user is a builder and everyone plays everyone else's game. Plus, it all happens in a space station.

Sounds confusing; is confusing, at least at first. During my maiden voyage within the shiny walls of Cyberion City (or microMUSE, as it's more officially known), I felt as though I'd been dropped into downtown Tokyo with only a flashlight and a screwdriver.

Robots everywhere; other players zipping around. Announcements coming over the public address system, promising untold delights in Section 7, Arc 3, or Section 2, Arc 0. Visit Narnia; visit Oz; visit Disneyland; visit Moscow. And now there's a dragon that wants to take you somewhere. And now there's a statue asking you questions.

Players can make robots of themselves; if you get good enough, there can be half a dozen little you's wandering around.

MATT FOSTER

Fortunately, you can type *who* and get online help—just ask any director anything at all. Type *page (playername) = message* and a friendly person will be at your side urging you to try stuff.

Trying stuff is the point. Eventually, if you stick with it, you'll get a residence. You can put anything in that residence you want; if you ask, one of the many friendly directors will teach you how to build objects and how to make them do odd things. A flower that turns into a refrigerator; a refrigerator that turns into a troll; a troll that turns into a gateway to a planet on the back side of the universe.

Players can make robots of themselves; if you get good enough, there can be half a dozen little you's wandering around.

Lost? There's a robot named Caspian who can tell you how to get anywhere in the space station—and a few places beyond. Or type *go home* anywhere at any time, and you will.

I can't begin to tell you everything there is in Cyberion City; it will have changed a lot by the time you read this anyway. (And if you become a citizen, you'll change it some more; you could be a microMUSE legend in the making.)

And it's free.

microMUSE is an educational device; all the people running it, including the people who designed it originally, are volunteers. The Massachusetts Institute of Technology gives it free disk space; MIT is interested, in a vague sort of way, in what will happen in this superheated *(Continued on page 240A-58)*

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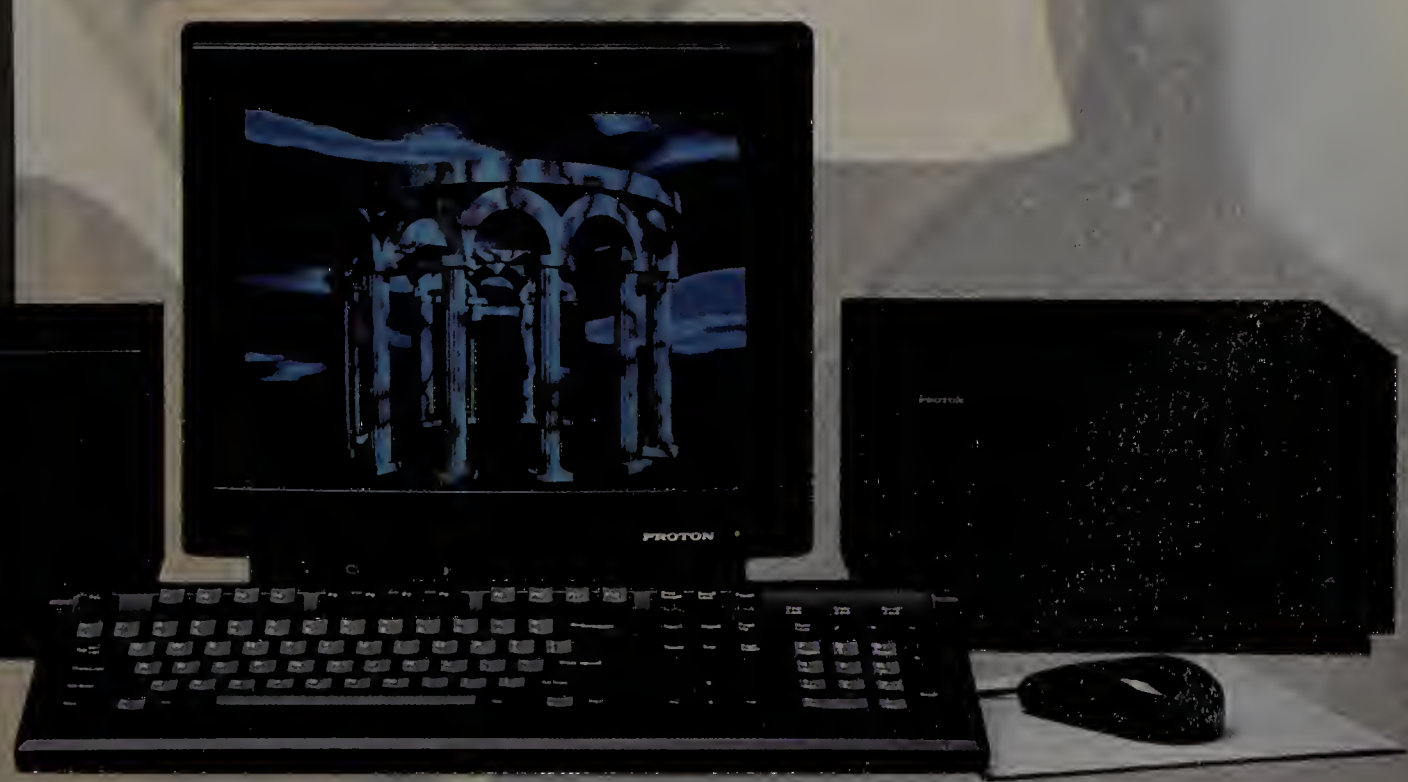

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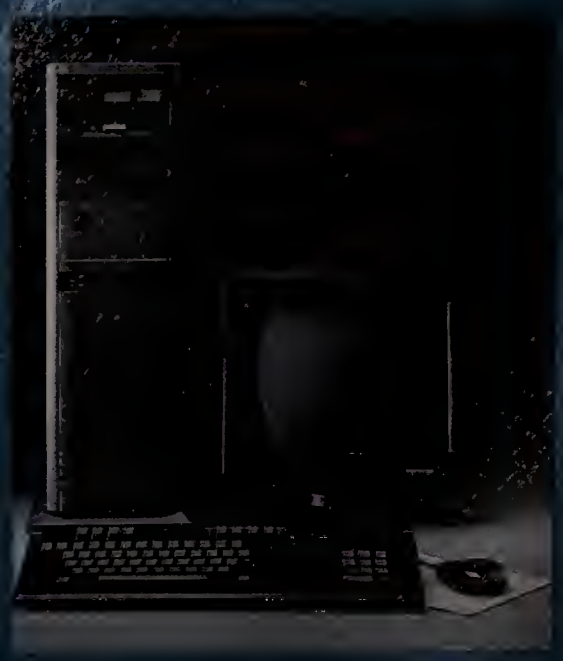

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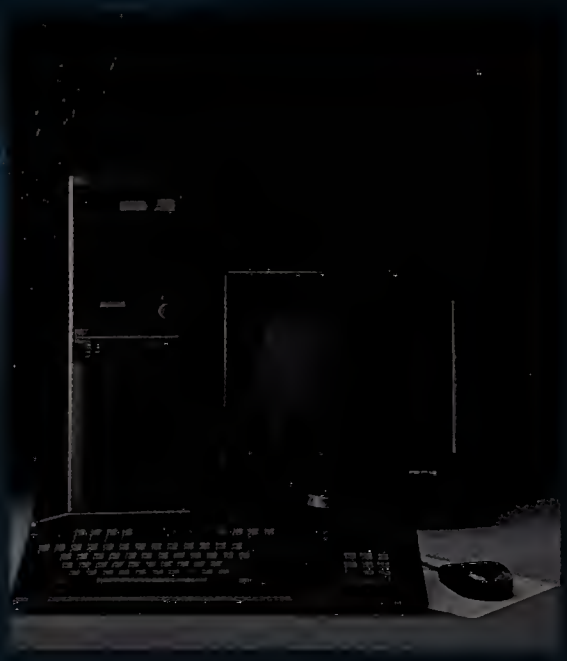

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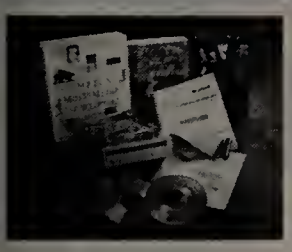

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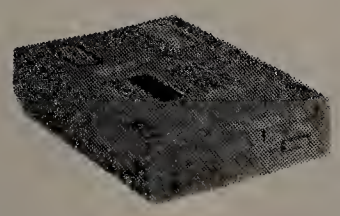

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(Continued from page 240A-52)
intellectual environment.

So is everyone else; that's always the payoff. It's the fourth generation of hackers now, but information still wants to be free.

There is a code of behavior on micro-MUSE, partly because there are kids on-line. You'll be given a copy of the charter and asked to agree to its provisions. Disputes are settled in a "trial" setting, with a prosecutor, and a defense attorney, and an impartial judge.

The kids part is important; Cyberion City is passionately designed to be a land of unlimited challenge for young cyber-nauts. The chief code hacker at micro-MUSE is 14 years old; the youngest user is six.

Oh sure, right, all of a sudden it sounds too wimpy for words. But it isn't. Here's a small wager: I'll bet you won't be able to figure out how old your fellow players are, unless they choose to tell you. In fact, you might spend a lot of time talking to an artificial intelligence program if you're not careful; there's a lot of tricky stuff in Cyberion City, more all the time.

How virtual? Which reality? Kids in cyberspace are just time traveling through their own lives—and yours.

You'll need access to an Internet host; you probably know if you have one. E-mail *micromuse - registration @ chezmo-to.ai.mit.edu* for all the details. M

Jon Carroll is a daily columnist for the San Francisco Chronicle *and a computer dodo.*

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TechnoLust *(Continued from page 240A-35)*

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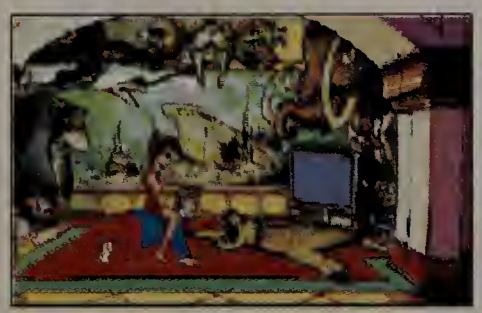

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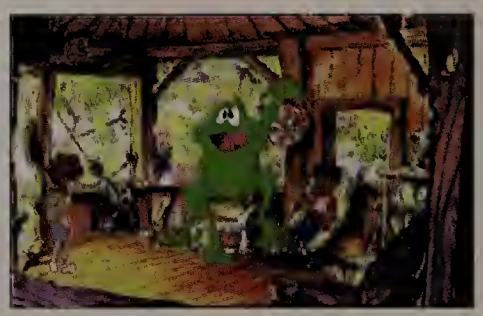

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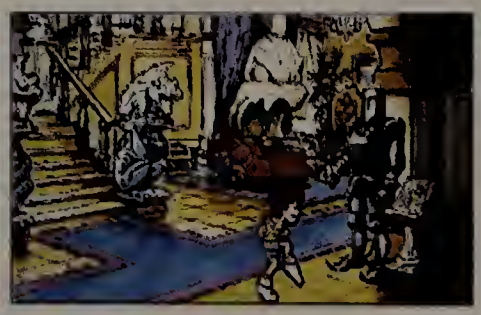

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Q. *Sometimes I want to be able to access my office PC from my laptop when I'm on the road, but I'd prefer not to leave the office system on for weeks at a time. Is there some way to turn it on remotely by phone?*

BARRY SMITH
FREMONT, CALIFORNIA

A. We found three available products that will let you remotely switch on the power to your computer: PhoneBoot, Remote Power On/Off, and the X-10 Powerhouse system.

PhoneBoot looks much like a regular six-outlet power strip, except it also has two RJ-11 telephone jacks. Connect one jack to the wall and the other to your modem, and plug your computer equipment (or anything else you want to control remotely) into the outlets. When you're at the office, hit PhoneBoot's on/off switch to power your PC and peripherals. Before you hit the road, you revise your AUTOEXEC.BAT so it will load your remote-control program or launch your communications program in host mode, and then use only Phoneboot's on/off switch to turn off the power to your system. To turn on the power to your computer remotely, dial in from a touch-tone phone and tap in a three-digit security code. PhoneBoot automatically turns on the outlets. (Alternatively, you could write a script for your communications program to dial up and enter the code.) Then call back with your modem and log on to your system. After you hang up, PhoneBoot waits for 20 minutes, then turns off the power to your computer.

Remote Power On/Off hooks between your PC equipment and the wall just like PhoneBoot does, but you get only one outlet. Depending on how you specify the settings, it turns on your PC after 1, 6, or 12 rings; after you hang up, it shuts off either immediately or 2, 15, or 60 minutes later.

The X-10 Powerhouse system encompasses a whole range of modules you can use to control electrical devices in your office (or home), either from a dedicated master controller or with software you run on your PC. You need only two modules to turn on the power to your computer. You insert an Appliance Module between your PC's power plug and the wall socket, and plug a Telephone Responder into the same touch-tone phone line your modem uses. The dial-in process is pretty much the same as with PhoneBoot, except you need to call back after your telecommunications session to shut off the power to the system.

WHERE TO BUY

PhoneBoot
Cybex Corp.
2800-H Bob Wallace Ave.
Huntsville, AL 35805
205/534-0011, 205/534-0010 (fax)
LIST PRICE: $395
Reader service no. 663

Remote Power On/Off
Server Technology, Inc.
2332-B Walsh Ave.
Santa Clara, CA 95051
800/835-1515, 408/988-0142
LIST PRICE: $169.95
Reader service no. 664

X-10 Powerhouse Telephone Responder, X-10 Powerhouse Appliance Module
X-10 USA Inc.
91 Ruckman Rd.
Closter, NJ 07624
201/784-9700, 201/784-9464 (fax)
LIST PRICE: Responder $70, Appliance Module $16
Reader service no. 665

Q. *I use* WordPerfect Office's *Shell as a task swapper. I've upgraded my 386 to 8MB of RAM, more than enough to load all my applications at once. The problem is that when I start* Quattro Pro, *it grabs all available expanded memory and hangs on to it. That means programs I load afterward are swapped to disk, slowing down switching. In addition, my other programs can't use expanded memory. Do you have a work-around?*

RUTH JONES
GRANVILLE ISLAND, BRITISH COLUMBIA, CANADA

A. One trick that works with almost any memory-hogging program or task switcher is to load all your other programs first. That way, the task switcher has reserved each of your other programs enough expanded memory for swapping before you load the problem program. With *Office*, you can make this automatic by toggling the Start Resident? option in Shell's Program Information screens to YES for every program except *Quattro Pro*.

For *Quattro Pro*, however, there's an even better solution: Restrict the amount of expanded memory the program locks up by using the /E start-up option. Follow /E with the number of 16K expanded memory *handles* (blocks) you want *Quattro* to use. For example, to allocate 1MB of memory, use Q /E64 to start *Quattro Pro*. To use this option with *Office*'s Shell, enter /E64 in the

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Note: These games require EGA or VGA graphics.

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- ☐ Best EGA Mouse Solitaire (4 disks) (1930) - 13 fabulous Solitaire card games that use a mouse. (EGA) (Mouse)
- ☐ Best EGA/VGA Tetris Clones (4 disks) (1920) - 17 high resolution variations including a couple of 3-dimensional ones! (EGA)
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Note: These disks require Windows 3.0 or 3.1

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Startup Options field of *Quattro*'s Program Information screen.

Q. *I have a 16-MHz 286 with 2MB of RAM and MS-DOS 4.01. The MEM command tells me that the largest executable program size is 550,240 bytes, yet I get a 'Program too big to fit in memory' message when I try to run a program that's only 539,042 bytes long. Any suggestions would be greatly appreciated.*

JAMES BURNIP
COMPUSERVE 70703,3041

A. Programs often require more memory than the EXE or COM file takes up on disk. Programs may load additional files or may reserve additional memory as work space. You probably need to free up some memory. Make backup copies of your CONFIG.SYS and AUTOEXEC.BAT before you make changes, then check the files for items you don't actually use and can remove. RAMDRIVE.SYS and SMARTDRV.SYS use the most memory, ANSI.SYS, GRAPHICS, and FASTOPEN less. You can experiment with lower settings for FILES and BUFFERS, though some programs may not run properly if you set these too low. If you upgrade to DOS 5.0, you can free up about 45K by loading DOS into high memory and even more by loading your device drivers and TSRs high, too.

If the program still won't run in the amount of memory you have available, it's likely that it's incompatible with your version of DOS, with some memory-resident software, or with some unusual hardware in your system. Such conflicts sometimes result in misleading 'Program too big to fit in memory' errors.

Q. *I recently upgraded to DOS 5.0. I use a security program, Fischer International's* Watchdog, *that supports DOS only through version 4.0. I understand I could use SETVER to let* Watchdog *run under 5.0, but I don't know how to use it.*

ANTHONY LEE
WEST HOLLYWOOD, CALIFORNIA

A. SETVER is a DOS 5.0 utility that tells programs they're running under earlier versions of DOS. This little lie is often all that's necessary to get a program to run under DOS 5.0. First, enter the command **SETVER WDRIVER.SYS 4.0** at the DOS prompt to add *Watchdog*'s device driver to SETVER's version table. (When using SETVER for other programs, you might specify an EXE or COM program instead of a SYS driver. And if a program required, for example, DOS 3.3, you'd replace the 4.0 with 3.3.)

Next, insert the line **DEVICEHIGH =C:\DOS\SETVER.EXE** in your CONFIG.SYS. Because SETVER must be loaded before *Watchdog*'s device driver is, be sure to put SETVER's DEVICE command before WDRIVER.SYS's.

Reboot. *Watchdog* will think it's running under DOS 4.0 and should have no problems. If you find the program still won't run, you have three choices: Upgrade the application, go back to an earlier version of DOS, or stop using the application.

Note that even though *Watchdog* should work fine using SETVER, Fischer International suggests you upgrade to its new, DOS 5.0–compatible version. If you do upgrade, be sure to use the command **SETVER WDRIVER.SYS /D** to remove WDRIVER.SYS from SETVER's version table.

Q. *Can you explain DOS's STACKS command? I read the manual but am still not sure if I should add it to my CONFIG.SYS file.*

ED KEIM
DILLSBURG, PENNSYLVANIA

A. Stacks are small chunks of memory used by DOS and a few applications to manage hardware interrupts. The default setting is nine 128-byte stacks (9,128).

Unless your computer manual or the installation instructions for an application specify a STACKS setting, or an installation utility adds one, don't worry about it. In most cases, you can even use a setting of STACKS=0,0 to free up the 1152 bytes of base memory the default

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setting uses. However, some programs and device drivers may not run properly without stack space. If you run into trouble, take STACKS=0,0 out.

In the rare event that two programs require different STACKS commands, use the larger values from each program. For instance, if one program wants STACKS=10,128, and another wants STACKS=9,256, you should use STACKS=10,256.

Q. *Our office is moving to* Windows, *so we want to upgrade our 16-MHz 386SX (an NEC PowerMate SX Plus) from 2MB to 4MB. Our dealer wants $450 for NEC's upgrade board. This seems exorbitant, since on other systems such an upgrade costs less than half that. Why the big difference? Is there a cheaper alternative?*

SUSIE SANDERS
NEW LONDON, NEW HAMPSHIRE

A. Over the last few years, most PC manufacturers have redesigned their systems to use standard single in-line memory modules (SIMMs). On those systems, you upgrade memory either by plugging in additional SIMMs or by replacing existing SIMMs with higher-capacity ones. With SIMM prices at $45 (or less) per megabyte and dropping, upgrades are relatively cheap.

Older systems use various kinds of proprietary memory hardware that vary from one brand to another and even—as in NEC's case—between different models from the same company. Generally, these are modules that plug into sockets on the motherboard, memory boards that plug into a special slot, or a combination of the two. These upgrades are always more expensive than using SIMMs, but there are often less costly third-party alternatives.

Though it's not always possible to find memory upgrades for older systems (especially if the manufacturer has gone out of business), we found two companies that carry upgrades for your system. They're good bets for those looking for upgrades for other old systems, too.

Before you buy a proprietary RAM board, though, seriously consider trading in the system. Though a 16-MHz 386SX will run *Windows*, you're likely to find it irritatingly slow. The money you'd spend on the board, plus what you'd get for selling the old SX, would add up to a substantial down payment on a faster system.

WHERE TO BUY

First Source Int'l Inc.
36 Argonaut #140
Aliso Viejo, CA 92656
800/535-5892, 714/588-9866
Reader service no. 666

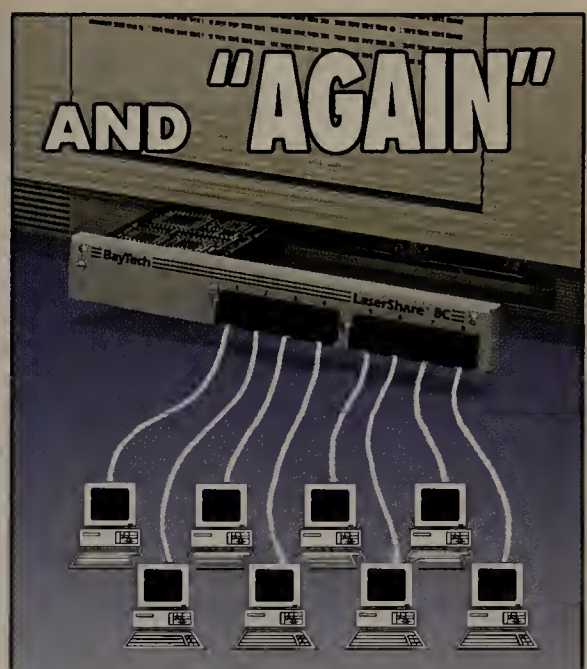
Performance Memory Products Inc.
1565 Cree St.
San Marcos, CA 92069
800/255-8607, 619/471-9691 (fax)
Reader service no. 667

POWER TIP NO. 254

Looking Up Data With Norton

If you have a copy of *The Norton Utilities* installed on your PC, you can use it to quickly find data, regardless of its file's format, thanks to *Norton's* Text Search program (TS.EXE). For instance, if you keep addresses in a file called ADDRESS.DOC in a directory called C:\DATA and you keep *Norton* programs in the \NORTON directory, you can create a one-line batch file called ADDRESS.BAT: **C:\NORTON\TS C:\DATA\ADDRESS.DOC "%1"**. Once you've saved this file in a directory that's referenced in your AUTOEXEC.BAT's PATH command, you can find any name in your address file by simply typing **ADDRESS** *name* at the DOS prompt.

Kenneth Naversen
Long Beach, California



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From PC to TDD Redux

Our March item on how to use your PC to communicate with a TDD (Telecommunications Device for the Deaf) prompted programmer and TDD expert Norman Williams to tell us about additional options for making such a connection. ASCII-TDD and Futura-TDD are programs that let you use a conventional modem to communicate with TDDs that have ASCII capability. When used with one of the special TDD-compatible modems listed below, the programs can exchange messages with any TDD.

POWER TIP NO. 255

Remapping <Home> and <End> in WordStar

In *WordStar 5.x* and later, the default assignment for <Home> duplicates <Ctrl>-QE (upper screen left), and <End> duplicates <Ctrl>-QX (lower screen right). You can remap these to have <Home> and <End> take the cursor to the beginning and end of the line, respectively.

First, make a backup of your program file. Go to the DOS prompt in your *WordStar* program directory, and enter **wschange ws.** At the main menu, type **e=248** and press **<Enter>.** You should see a line that begins '0248 11 05 02 00 4F 02 11 18 02 00'. Press **<Enter>** to move the cursor under '05'. Type **13,** then press **<Enter>** five more times to place the cursor under '18'. Type **04** followed by a period to redisplay the string; it should now begin with '0248 11 13 02 00 4F 02 11 04 02 00'. Press **x,** then **<Ctrl>-XY** to save the changes.

Ken Smith
San Francisco

WHERE TO BUY

ASCII-TDD 1.1
Technology Assessment Progrom
Golloudet University
MSSD-200
800 Florida Ave. NE
Woshington, DC 20002
202/544-3613 (BBS, 2400 baud), 202/651-5257 (TDD), 202/651-5476 (fax)
LIST PRICE: free from BBS, $3 by moil
Reader service no. 668

Futura-TDD 2.01, CM-4 (external modem)
Phone-TTY Inc.
202 Lexington Ave.
Hackensock, NJ 07601
201/489-7889, 201/489-7890 (TDD), 201/489-3323 (BBS)
LIST PRICE: software $40, modem $350 (includes Futuro-TDD)
Reader service no. 669

IBM Phonecommunicator
IBM Special Needs Information Referral Center
P.O. Box 2150-H06R1
Atlonto, GA 30301-2150
800/426-2133, 800/284-9482 (TDD)
LIST PRICE: $600 (includes softwore)
Reader service no. 670

Intele-Modem (external modem)
Ultratec Inc.
450 Science Dr.
Modison, WI 53711
608/238-5400 (voice or TDD)
LIST PRICE: $329
Reader service no. 671

Smart Modem SM-85 (external modem)
Krown Research
129 Sheldon St.
El Segundo, CA 90245
800/833-4968 (voice or TDD), 310/322-3202 Colifornio (voice or TDD)
LIST PRICE: $349
Reader service no. 672

Mail your questions to The Help Screen, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Help Screen; CompuServe, 75300,3205; MCI Mail, 381-7106; Internet, duck@well.sf.ca.us; 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

Karl Koessel is the technical editor and Robert Lauriston a contributing editor for PC World.

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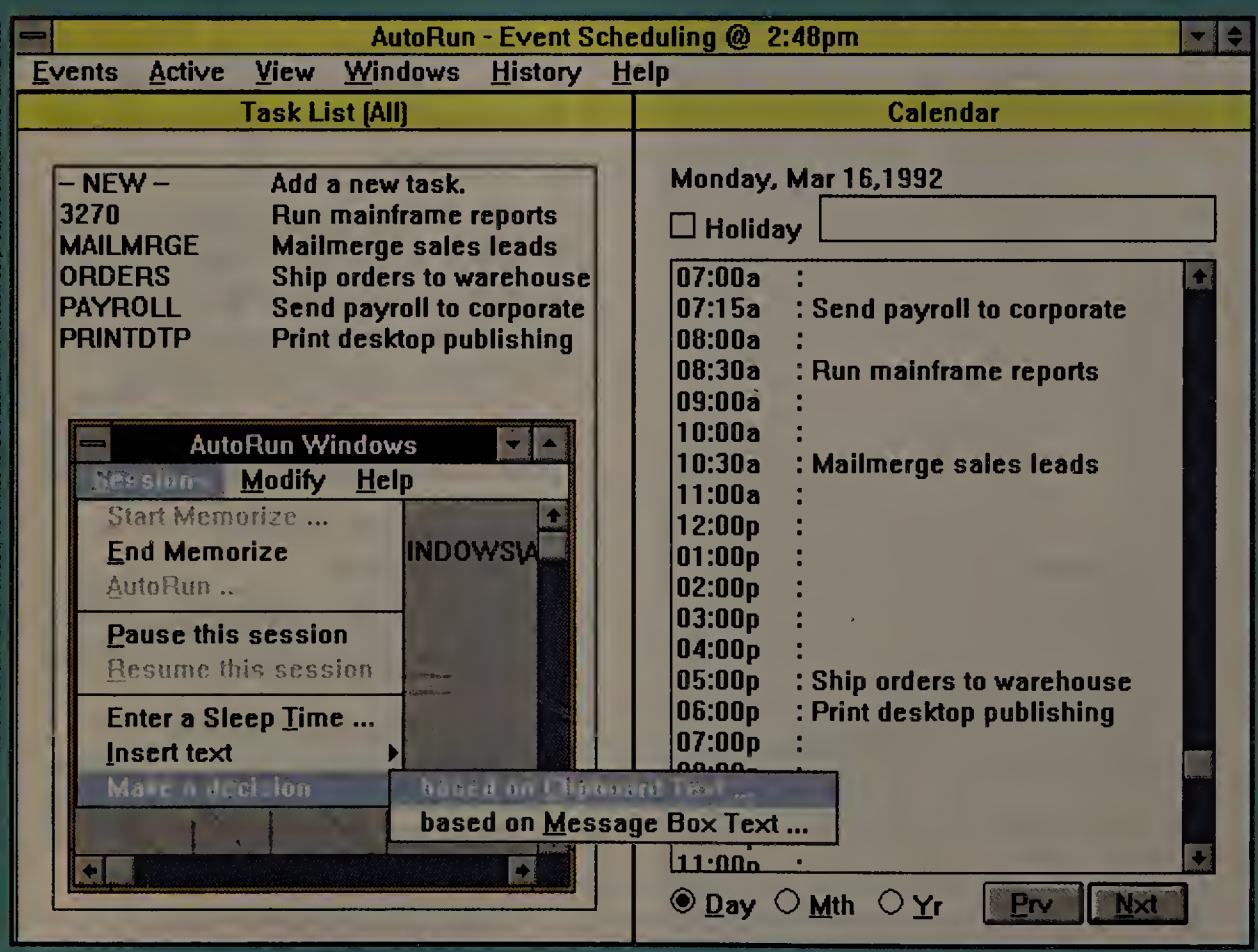

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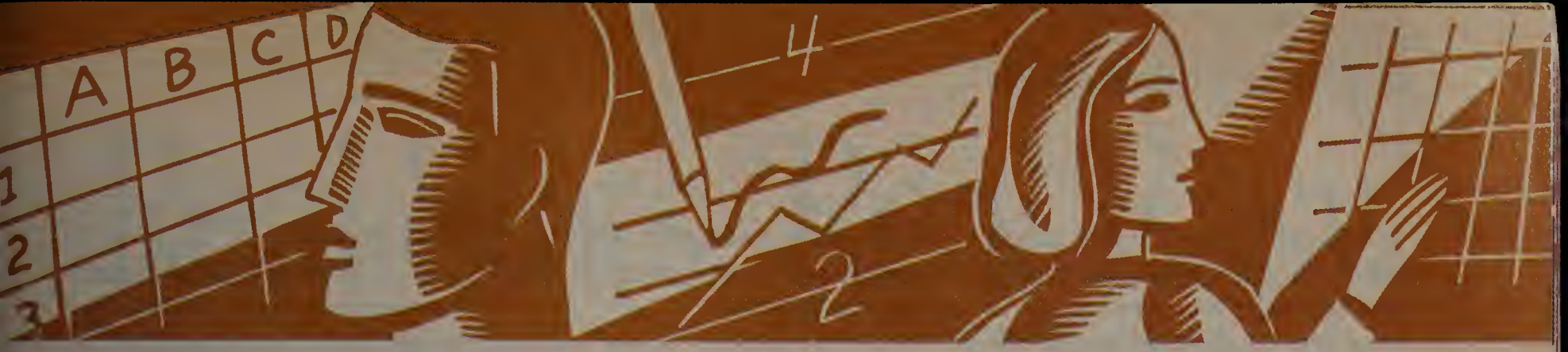

SPREADSHEETS (A..Z)

BY RICHARD SCOVILLE

Practical tips for building better worksheets

A lot of former *1-2-3* users are switching to *Excel* these days, but not all of them are taking advantage of their new spreadsheet. If you've recently made this change and you're still doing things the *1-2-3* way, you're probably wasting a lot of effort; *Excel* has tricks to make your job much easier. This month we'll build the budget worksheet shown in **FIGURE 1**, taking full advantage of *Excel*'s features, and we'll show off *Excel*'s outliner along the way.

To start the model, open a new worksheet file. Make sure the tool bar is visible on your screen; if it isn't, select *Options • Workspace,* click the box for *Toolbar,* and click *OK.* (If you're using *Excel 4.0,* the command is *Options • Toolbars.*) Now enter the label shown in A2, and click the *B* button on the tool bar to boldface it. Enter **Total** in A8, then click on the *B* and *I* tool bar buttons to boldface and italicize the label. Enter the labels in the range B1..C1, or as it's called in *Excel,* B1:C1.

Now let's see how *Excel* can really make things easier. In D1, enter **7/92**; *Excel* will interpret your entry as a date value and format it in the mmm-yy format. Next, select D1:F1, then hold down **<Ctrl>** and select H1:J1; note that you've just highlighted two separate ranges (try doing that in *1-2-3!*). From the menu, choose *Data • Series;* in the dialog box, click the radio buttons for Rows, Date, and Month, then click *OK; Excel* fills in the selected cells with month values calculated from cell D1. Enter the labels shown in G1, K1, and L1. To format everything in row 1 to centered bold italic, click on the *1* row label in the left frame to highlight the entire row, then on the *B, I,* and *Center* buttons on the tool bar (the Center button is the stack of centered lines directly below the 'o' in the menu bar's Macro option).

Enter the labels and values shown in B3:C7. To quickly enter some dummy data values, select D3:F3, type **10000**, and press **<Ctrl>-<Enter>**; then highlight D4:F7, type **1000**, and press **<Ctrl>-<Enter>** again. To format the data, select D3:F7, choose *Format • Number,* select the *#,##0* format from the list, and click *OK.* Notice that the range remains selected. To make these data values appear distinct from the formulas you're about to add, select *Format • Font,* click the field under Color in the dialog box, then choose dark blue from the list.

Now for the formulas. Select the range D8:F8, and click the tool bar's *Sum* button (it's labeled with the Greek letter sigma, which looks like a crooked *E,* or an *M* turned on its side—right below the 'O' in Option on the menu bar);

	A	B	C	D	E	F	G	H	I	J	K	L
1		*Expense*	*GL-No.*	*Jul-92*	*Aug-92*	*Sep-92*	*Q3*	*Oct-92*	*Nov-92*	*Dec-92*	*Q4*	*Year*
2	**Nashville District**											
3		Salaries	102	10,000	10,000	10,000	$30,000.00	10,000	10,000	10,000	$30,000.00	$60,000.00
4		Supplies	230	1,000	1,000	1,000	$3,000.00	1,000	1,000	1,000	$3,000.00	$6,000.00
5		Equipment	250	1,000	1,000	1,000	$3,000.00	1,000	1,000	1,000	$3,000.00	$6,000.00
6		Lease Pmts	780	1,000	1,000	1,000	$3,000.00	1,000	1,000	1,000	$3,000.00	$6,000.00
7		Advertising	875	1,000	1,000	1,000	$3,000.00	1,000	1,000	1,000	$3,000.00	$6,000.00
8	*Total*			$14,000	$14,000	$14,000	$42,000.00	$14,000	$14,000	$14,000	$42,000.00	$84,000.00
9												
10	**Greensboro District**											
11		Salaries	102	10,000	10,000	10,000	$30,000.00	10,000	10,000	10,000	$30,000.00	$60,000.00
12		Supplies	230	1,000	1,000	1,000	$3,000.00	1,000	1,000	1,000	$3,000.00	$6,000.00
13		Equipment	250	1,000	1,000	1,000	$3,000.00	1,000	1,000	1,000	$3,000.00	$6,000.00
14		Lease Pmts	780	1,000	1,000	1,000	$3,000.00	1,000	1,000	1,000	$3,000.00	$6,000.00
15		Advertising	875	1,000	1,000	1,000	$3,000.00	1,000	1,000	1,000	$3,000.00	$6,000.00
16	*Total*			$14,000	$14,000	$14,000	$42,000.00	$14,000	$14,000	$14,000	$42,000.00	$84,000.00
17												
18	**Grand Total**		$28,000	$28,000	$28,000	$84,000	$28,000	$28,000	$28,000	$84,000	$168,000	

ANTHONY RUSSO

FIGURE 1: Excel's assortment of shortcuts makes creating this budget worksheet an easy job.

a flashing border will appear around D3:D7 while the formula bar displays *=SUM(D3:D7)*. Press <Ctrl>-<Enter>; a set of formulas will appear in the range. With one difference, you can repeat the process for the G3:G8 totals: When you click the Sum button, the flashing box will incorrectly surround C3:F3 and you'll have to reselect the correct D3:F3 range. Next, highlight the D8:F8 and G3:G8 ranges together and use *Format•Number* to format them as *$#,##0_);($#,##0)*.

Now copy the data and formulas for the fourth quarter: Select D3:G8 and press <Ctrl>-<Insert>; then select H3 and press <Shift>-<Insert>. In L3, enter the formula **=SUM(K3,G3)**. Format the cell to *$#,##0_);($#,##0)*, select the range L3:L8, and in the menu choose *Edit•Fill Down*.

Now build the section for the Greensboro district. Select A2:L8 and press <Ctrl>-<Insert>; then select A10 and press <Shift>-<Insert>. Enter **Greensboro District** in A10 and boldface it. Enter the label in A18 and make it bold, and, finally, enter **=D8+D16** into D18, format it as *$#,##0_);($#,##0)*, select D18:L18, and use *Edit•Fill Right* to copy D18's formula into E18:L18.

Automatic Column Widths

In *1-2-3*, setting column widths can be a repetitious chore, but *Excel* can automatically set your column widths en masse. To set most of the columns to their proper width, click on the *B* in the frame above the worksheet, and drag to highlight columns B through L. Double-click on the right border of any of the selected column labels, and *Excel* will adjust the width of the columns to accommodate their longest entries. Because column A doesn't have to be as wide as its longest entry, adjust its width manually: Drag the border between the A and B column labels to the left until you've got a narrow column A.

Adjusting the height of rows 9 and 17 is a similar process. Click on *9* in the frame at the left edge of the sheet, then hold down <Ctrl> and click on *17* to select the two rows. Drag the border at the bottom of either row label to adjust the height of both of them.

No Pane, No Gain

If your worksheet is larger than the screen, it's easy to get lost when your row and column labels scroll off the sides. That's where panes and outlining come in.

Panes let you keep the labels in row 1 and in columns A through C on screen as you move around the sheet, much as titles do in *1-2-3*. To create panes, move the mouse pointer to the small black bar just above the arrow at the top of the vertical scroll bar. The pointer will turn into two horizontal lines with up and down arrows. Drag the pointer down until the gray line that appears is over the border between rows 1 and 2; when you release it, you'll see two copies of row 1. Drag the corresponding black bar at the left end of the horizontal scroll bar to the boundary between columns C and D. Select *Freeze Panes* from the Options or Windows menu, depending on whether you're using *Excel 3.0* or *4.0*. Now, as you scroll around the worksheet, the row and column labels remain visible.

When you're preparing a budget, your focus constantly shifts in and out; sometimes you want months, other times quarters. Wouldn't it be nice if your spreadsheet could zoom in and out to match your perspective? Take a look at **SCREEN 1**. Thanks to *Excel*'s outliner, the monthly detail has been collapsed to show only quarterly and yearly totals.

To set up the outline, select the entire worksheet by clicking on the box where the column and row frames intersect, directly to the left of the 'A' and above the '1'. Then click the *Show Outline Symbols* button on the tool bar: It's just under the 'D' in Data on the menu bar (in release 4.0, select *Formula•Outline* and click *OK* in the dialog box). A message box will appear on your screen, offering to create an outline; click *OK*.

You now have three-level outlines both vertically and horizontally, represented by sets of '1', '2', and '3' buttons at the top of the left margin and at the left edge of the top margin, and by the level bars within the margins. To collapse an outline level and hide its detail rows or

Excel Shortcut

USE OUTLINING TO SELECT LARGE RANGES

by Ralph Soucie

Outlining not only helps you organize your spreadsheet work, but it's helpful when you need to copy large ranges.

Let's use Richard Scoville's budget worksheet (**FIGURE 1** in the accompanying article) as an example. Collapse the outline by clicking the *1* button for rows and the *2* button for columns. The worksheet now displays only the quarterly totals. Copy the range A1:L18 to cell A20. If you expand the outline to show the monthly totals again, you'll see that *Excel* has copied all the budget amounts, monthly and quarterly, to the paste range.

But what if you want to copy only the quarterly totals, perhaps to create a worksheet for long-range financial planning? Select A1:L18 again, then click the *Select Visible Cells* button on the tool bar (it looks like a sideways cross and is directly below the Data menu's 't' in Data on the menu bar). Now perform the copy operation. *Excel* copies only the "visible" cells (the quarterly numbers) to the paste range.

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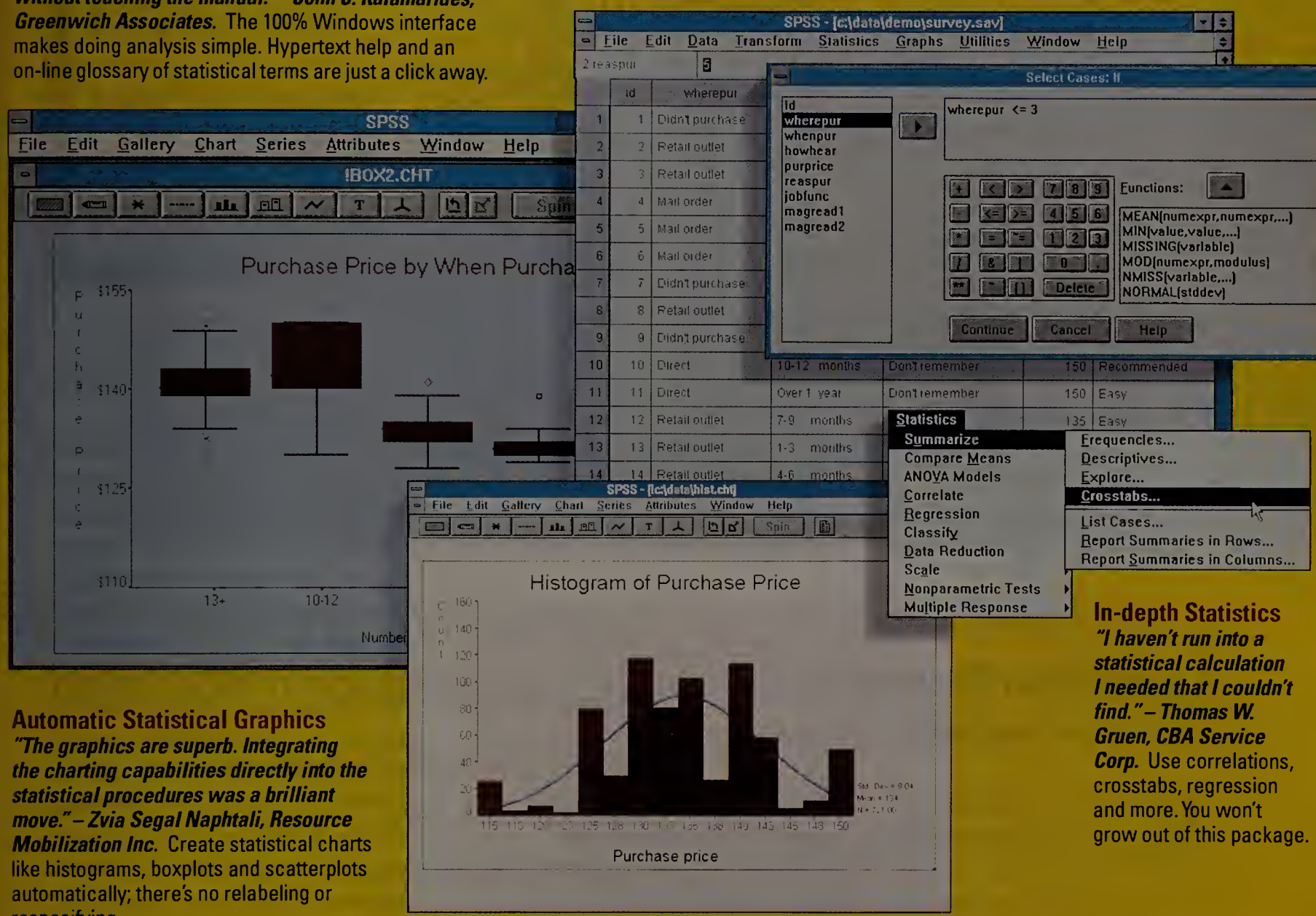

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columns, click on one of the numbered buttons or on the minus signs in the left or top margin. For example, to make your screen look exactly like **SCREEN 1**, click the '3' button for rows and the '2' button for columns.

Excel's graphical interface and intelligent shortcuts make the chore of building your worksheets almost a game. And the outliner makes it easy to view your data in the most meaningful way. In our next column, we'll show you the simple way to consolidate multiple *Excel* budget worksheets into a single summary sheet.

Q. *I'm using* 1-2-3 for Windows *to store a list of bibliographic references. To save space, I put all the authors for each article into the same data base field, like so:*

A
1 AUTHOR
2 Brophy, LS and GH Heichel
3 Lory, JA and MP Russelle

I need to search for records by authors' last names. It's easy to find Lory: *I just use* Lory* *in the criteria range. But how can I search for* Russelle *or* Heichel?

MARKAS DABACH
ST. PAUL

A. I'll assume you know how to use the Data • Query commands and have set up the appropriate Input, Criteria, and Output ranges. In your example, you'll also select cell A1 and use the */Range • Name • Labels • Down* command to name cell A2 'AUTHOR'. To find the cells that contain an author's name in any version of *1-2-3*, enter the name you're searching for in cell C1, then enter the following logical formula in your criteria range: **#NOT#@ISERR(@FIND(C1,AUTHOR,0))**. When you use Data • Query • Extract, you'll get the data you want in your Output range.

Here's how it works: The @FIND() function yields the starting position of one string of characters within another; in this case, it finds the name you entered in C1 within the Author field, beginning at position zero. The absolute cell reference on C1 is required whenever a criterion formula refers to a cell outside the data base range. If the first string is not found within the second one, @FIND() yields ERR, and the @ISERR() function is true. The logical operator #NOT# reverses its logical value. In other words, the formula is true whenever the name you entered in C1 can be found in the Author field.

Mail your spreadsheet questions to Spreadsheets (A..Z), PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Spreadsheets (A..Z); CompuServe, 72341,2727; MCI Mail, 357-4517; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

Richard Scoville and Ralph Soucie are contributing editors for PC World. ■

BUDGET.XLS

	A	B	C	G	K	L
1		Expense	GL-No.	Q3	Q4	Year
2	Nashville District					
3		Salaries	102	$30,000.00	$30,000.00	$60,000.00
4		Supplies	230	$3,000.00	$3,000.00	$6,000.00
5		Equipment	250	$3,000.00	$3,000.00	$6,000.00
6		Lease Pmts	780	$3,000.00	$3,000.00	$6,000.00
7		Advertising	875	$3,000.00	$3,000.00	$6,000.00
8	Total			$42,000.00	$42,000.00	$84,000.00
9						
10	Greensboro District					
11		Salaries	102	$30,000.00	$30,000.00	$60,000.00
12		Supplies	230	$3,000.00	$3,000.00	$6,000.00
13		Equipment	250	$3,000.00	$3,000.00	$6,000.00
14		Lease Pmts	780	$3,000.00	$3,000.00	$6,000.00
15		Advertising	875	$3,000.00	$3,000.00	$6,000.00
16	Total			$42,000.00	$42,000.00	$84,000.00

SCREEN 1: Excel's outliner lets you tuck away file details.

Spreadsheet Toolbox

TEMPLATES THAT MEAN BUSINESS

Mastering your spreadsheet program's commands and procedures isn't all that difficult; building models that answer important questions is. For years financial professionals and business school students have relied on the spreadsheet columnists at *CFO* (*Chief Financial Officer*) magazine—Jack McGrath, Jason O'Neal, and others—for expert advice on topics such as cash flow, securities management, taxes, inventories, capital investment, break-even analysis, and company valuation.

Intex Solutions has collected 24 of *CFO*'s best templates into its $299.95 *CFO Spreadsheet Applications.* Each template comes with the full text of the original column, so you can read the comments and instructions that came with it. These models are a veritable treasure trove of good ideas for financially interested spreadsheet users.

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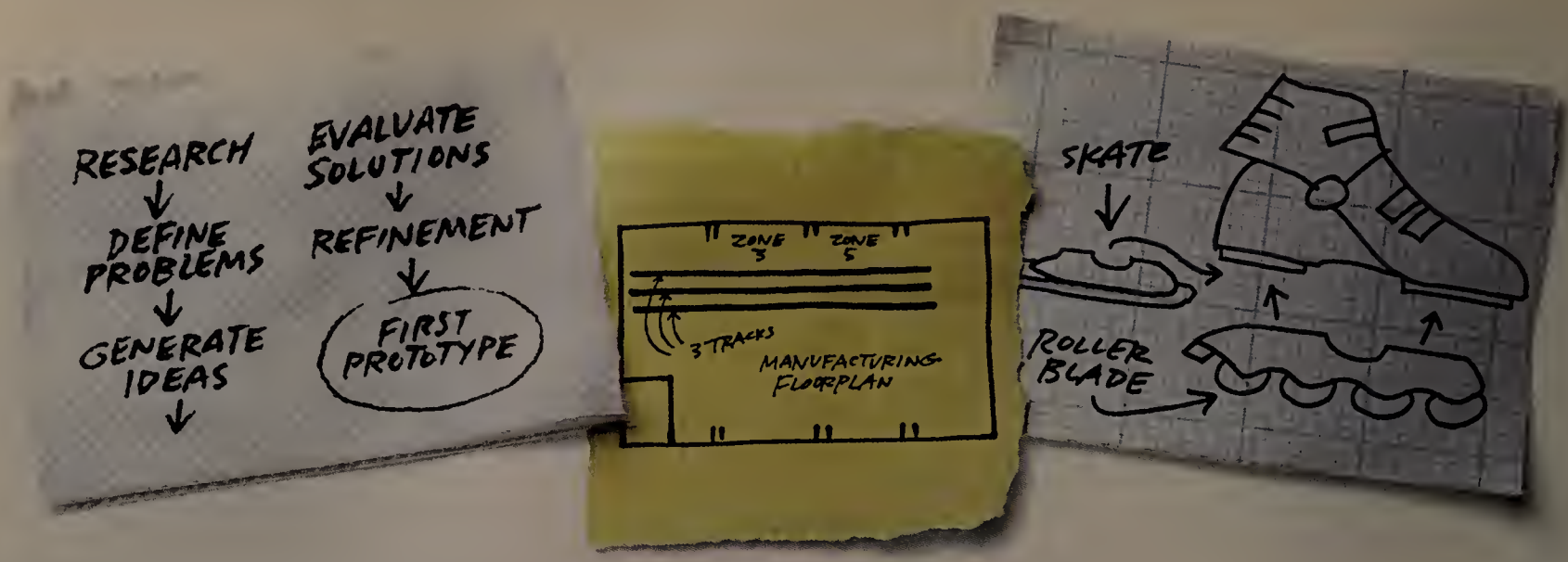
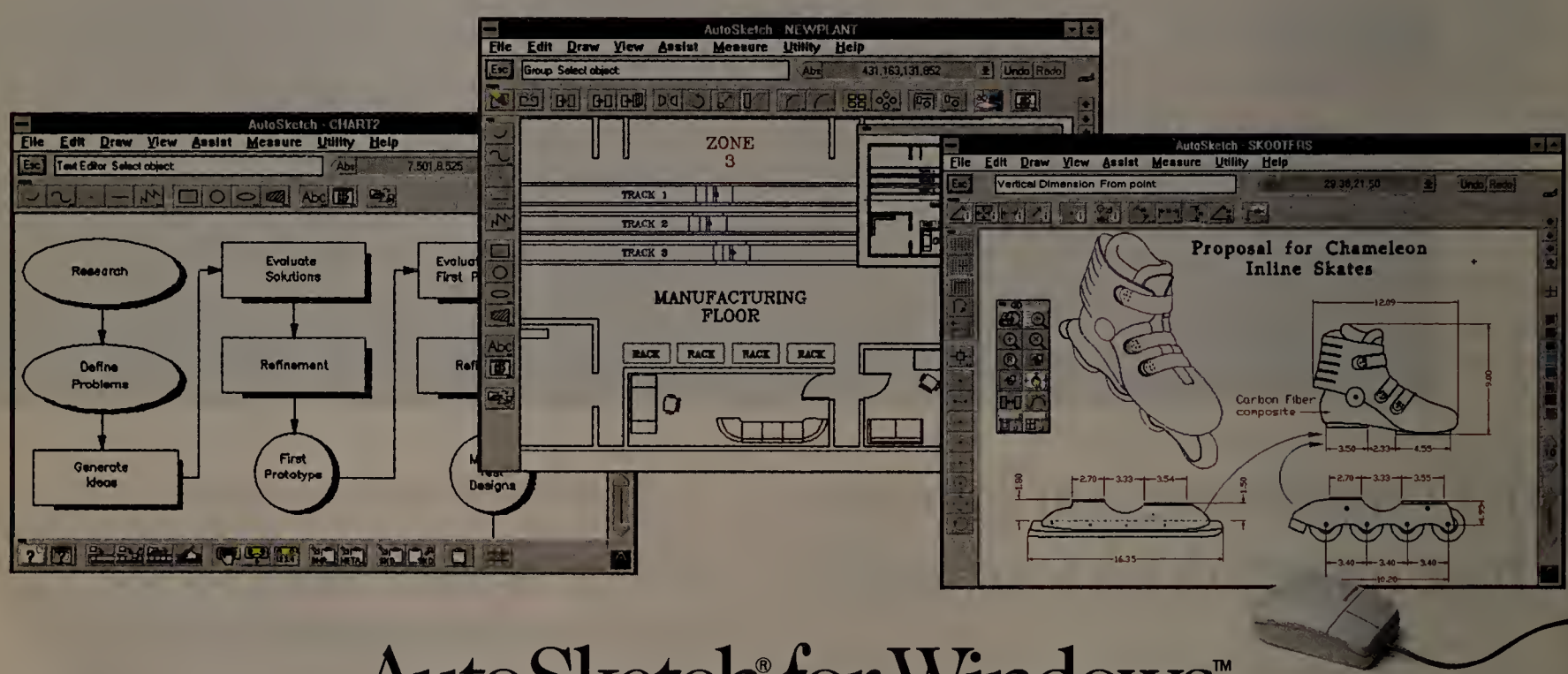


Sketch.



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WORD PROCESSING CLINIC

BY GEORGE CAMPBELL

Tips for getting the most out of your word processor

Q. *I use* WordPerfect 5.1, *along with a lot of other software. I can't make any sense of the way* WordPerfect *handles moving the cursor. The keystrokes that work in other applications work differently in* WordPerfect. *Can you offer a quick reference?*

DAN JEROME
BURNSVILLE, MINNESOTA

A. You're absolutely right; *WordPerfect* uses a nonstandard set of keystrokes for cursor movement that involves using the <Home> key to navigate. Here's the concept:

Press a cursor key by itself to move the cursor one unit—that is, one character left or right or one line up or down—at a time. The <Page Up> or <Page Down> key moves the cursor to the beginning of the previous or next print page.

Press <Ctrl> plus a cursor key to move by word or to the beginning of a paragraph. <Ctrl>-<Right>/<Left> moves a word at a time. <Ctrl>-<Up> moves to the first character of the current paragraph (or if the cursor is on the first character of the current paragraph, to the start of the previous paragraph). <Ctrl>-<Down> takes the cursor to the first character of the next paragraph.

When you press <Home> followed by a cursor key, *WordPerfect* will jump to the extremes of the visible editing screen. For example, try pressing <Home><Up>/<Down> to move the cursor to the first or last line of the current screen (or press the number pad's <Plus> or <Minus> key instead as a shortcut). If you're already on the first or last line of a screen, press <Home><Up> or <Down> to move to the first or last line of the previous or following screen. Pressing <Home><Right>/<Left> moves the cursor to the last or first character at the edge of the screen.

Press <Home> twice followed by a cursor key to move the cursor through the entire document's text. <Home><Home><Cursor Right>/<Left> moves the cursor to the end or beginning of a line, even if it extends off the screen. <Home><Home><Up>/<Down> jumps to the top or bottom of your text but ignores *WordPerfect*'s formatting codes.

Finally, press <Home> three times followed by <Up> or <Down> to jump to the beginning or end of the entire document, beyond any *WordPerfect* codes.

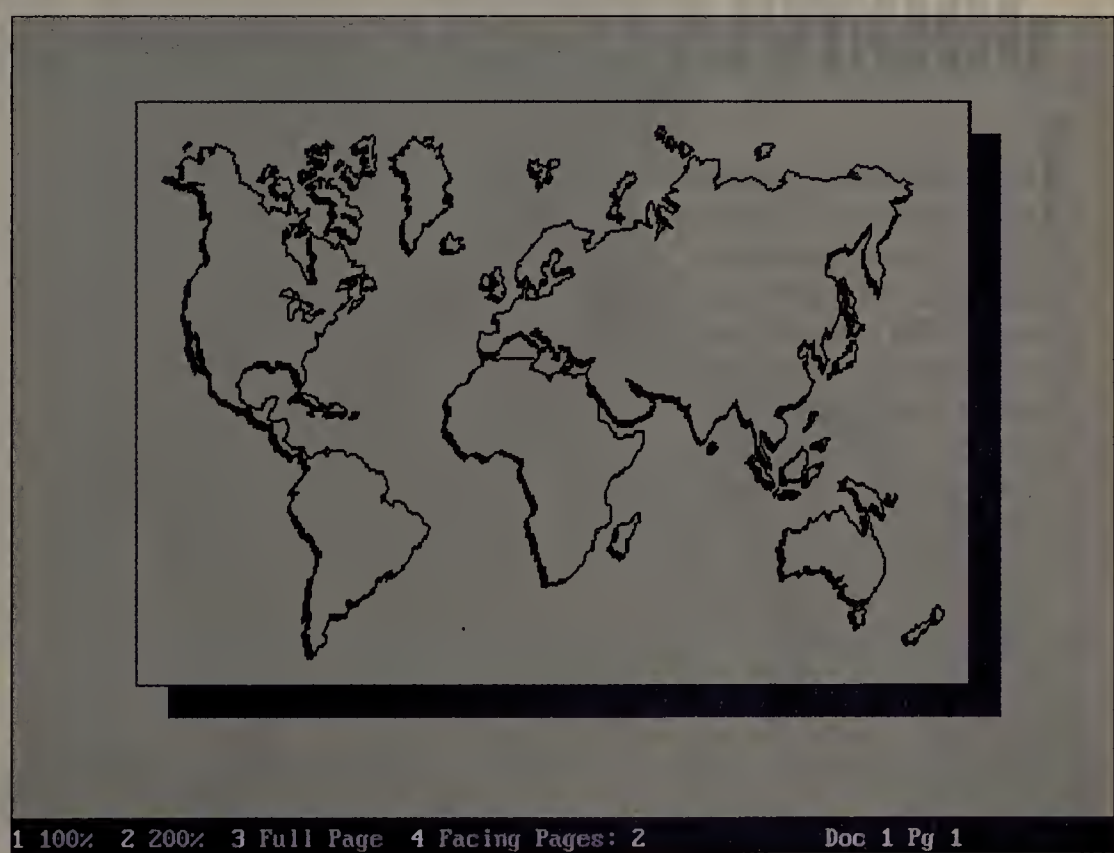
Q. *Is there a way to add shadowed borders around clip-art images to give them a three-dimensional look in* WordPerfect 5.1?

JEFFREY MARTIN
SUNNYVALE, CALIFORNIA

A. Happily, WordPerfect anticipated your need. You can't set border styles when you import a graphic file, but here's how to do it once the image is in your document:

First, select the image: Press **<Alt>-<F9>FE**, type the number of the figure (you'll see it in your document), and press **<Enter>** twice.

Next, set the borders for that image by pressing **<Alt>-<F9>FOB**. This selects the Border Style options in the menu. You'll see a list of border styles at the bottom of your screen.



By adding shadowed borders to graphical images in WordPerfect 5.1, you can lend them a three-dimensional look that will punch up your pages.

ANTHONY RUSSO

To produce a typical shadowed border, type **SESE**. *WordPerfect* automatically offsets thick and extra-thick lines to produce a shadow effect. When you're done, press **<Enter>** to return to the editing screen. If you want to see a preview of your page, press **<Shift>-<F7>V**.

CHARACTER	CODE
“	0147
”	0148
‘	0145
’	0146
–	0150
—	0151
«	0171
»	0187
©	0169
™	0174
¢	0162
•	0149

TABLE 1: To insert a special character in any Windows word processor, hold down the <Alt> key and type the character's code number on the numeric keypad.

Q. *I use* Adobe Type Manager *with* Ami Pro 2.0. *I need to produce typographical characters, such as true quotation marks, but they're not available on the keyboard. Is there a way to get typographical characters in* Ami Pro—*or* Windows, *for that matter?*

JONATHAN BALSAM
LAWRENCE, NEW YORK

A. If you use *Windows* there's an easy solution that will work with any *Windows* word processor. *Windows* uses the ANSI character set, which contains characters not available with a single keystroke, including the typographical characters you need. These characters are the same whether you use *Adobe Type Manager* or the TrueType fonts that come with *Windows 3.1*. To insert a special character, make sure <Num Lock> is on, then hold down the <Alt> key while you type the appropriate number from **TABLE 1** on the numeric keypad. Release <Alt> to insert the character. If you use any of these characters frequently, use your program's macro tools to record a hot-key macro containing the keystrokes. To access a typographical chart in *Windows 3.1*, just click on the Character Map icon in the Accessories group of Program Manager, copy the character you want, and paste it into your document.

Mail your word processing questions to Word Processing Clinic, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Word Processing Clinic; CompuServe, 71571,222; MCI Mail, GCAMPBELL; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

George Campbell is a contributing editor for PC World.

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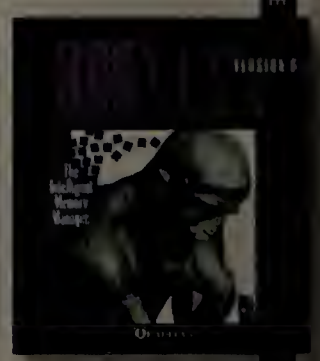

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Processor/MHz	i386®SX/25 i486®SX/20 i486SX/25	i386SL/20 i386SL/25	i386SX/25 i486SX/20 i486SX/25 i486DX/33	i486SX/20 i486DX/33 i486DX2/50	i486SX/25 i486DX/33 i486DX/50
Storage	60, 85, 120MB*	60, 85, 120MB*	80, 120, 200, 400MB	120, 200, 400MB	300, 400, 500MB* (up to eight)
Memory (Standard/Max)	2/8MB* 4/12MB*	2-4*/12MB	4/64MB	4-8*/128MB	4-8*/192MB
Video	VGA display up to 64 gray scales	VGA display up to 64 gray scales or active matrix color	Integrated SVGA @ 1024x768 resolution with 16 colors. Upgradeable to 256 colors.		Integrated SVGA @ 1024x768 resolution with 16 colors. Upgradeable to 256 colors.
Pre-installed Operating Systems	MS-DOS 5.0 with APM	MS-DOS 5.0 with APM, Microsoft Windows 3.1	MS-DOS 5.0 Microsoft Windows 3.1		MS-DOS 5.0*
Integrated Connectivity	N/A	Novell NetWare, Microsoft LAN Manager, Banyan VINES client shells pre-installed	Novell NetWare, Microsoft LAN Manager, Banyan VINES client shells pre-installed		Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO™ UNIX®**
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DATA BASICS

BY CELESTE ROBINSON

Tips and techniques for managing your data

Q. *When I use the* dBASE III *MODIFY COMM command to open a large program file, I get the message 'File too large'. Is there some way to tell* dBASE *to use a larger file?*

RENGY J. VERGHESE
DAYTONA BEACH, FLORIDA

A. You can't tell *dBASE* that you need to edit a bigger file, but you can tell it to use another text editor, one with a larger capacity. Here's how to do it: Add a statement to your CONFIG.DB file that says **TEDIT** = *editor*, where *editor* is your preferred text editor's path and file name. To use your favorite text editor when working with memo fields, also add the line **WP** = *editor* to your CONFIG.DB file.

Although program size isn't a problem in *dBASE IV*, you may still prefer your own editor to the one built into the program. The same CONFIG.DB commands will do the job.

Q. *I keep a list of projects I'm working on in a* Paradox *table called PROJECTS; I also keep a CLIENTS table, and I use the client number to link these tables together.*

In order to make sure that I don't create a project for a nonexistent client, I've set up PROJECTS' 'Client #' field with a table lookup validity check to the CLIENTS table; this way, Paradox *won't let me enter a client number into PROJECTS that's not already in CLIENTS, and I can easily bring up the CLIENTS table for lookup purposes if I can't remember a client's number.*

This all works fine, but if I'm adding a project for a new client, Paradox *won't allow me to create the new client record when I bring up the CLIENTS lookup table. Do you know of any way to get around this?*

DELIA BROWN
NEWARK, NEW JERSEY

A. As you've discovered, when you display one table for lookup purposes while entering data in another, you can't add a record to the lookup table. But don't heave a sigh of resignation yet; you can set up either a multitable form or a simple script to give yourself an editable lookup table.

The script is the easier way to do this. Copy **LISTING 1** to an ASCII text file called EDLOOKUP.SC in your working directory. To run the script and edit PROJECTS, press **<Alt>-<F10>**, select *Play*, type **EDLOOKUP**, and press **<Enter>**. The script will bring up PROJECTS and CLIENTS, with the cursor ready to edit a new record in PROJECTS. When you press **<F1>**, the cursor will move to CLIENTS, where you can select, edit, or create a record. Pressing **<F2>** will bring you and the current 'Client #' back to PROJECTS.

To use the script with other tables, replace the text strings 'Client #', 'Clients', and 'Projects' in the first three lines of the script with the names of your own key field and tables. The key field must have the same name in both tables.

If you prefer to do your editing in full-screen forms, you can skip the script and instead design a single form that will do much the same thing. First, use *Forms•Design* to create a form for CLIENTS, either single record or multirecord, that uses only a small amount of screen space. Next, create a one-page, one-record form for PROJECTS. As you place your fields, leave space on the screen for inserting the CLIENTS form. Once the PROJECTS fields are where you want them, select *Multi•*

```
keyf = "Client #"
VIEW "Clients"
EDIT "Projects"
IF NOT ATLAST()
 THEN END
ENDIF
DOWN
WHILE True
 WAIT TABLE
  PROMPT "F1: Client  F2: Do_It"
 UNTIL "F1", "F2"
 SWITCH
  CASE retval = "F1" :
   IF FIELD() = keyf
    THEN UPIMAGE
     WAIT TABLE
      PROMPT "F2: Select record"
     UNTIL "F2"
     ch = "val = [" + keyf + "]"
     EXECUTE ch
     DOWNIMAGE
     ch = "[" + keyf + "] = val"
     EXECUTE ch
    ELSE KEYPRESS "F1"
   ENDIF
  CASE retval = "F2" : DO_IT!
   QUITLOOP
  ENDSWITCH
ENDWHILE
```

LISTING 1: This Paradox script gives you an editable lookup table. Alter the first three lines to make this script match your own tables.

ANTHONY RUSSO

Table • Place • Unlinked. When prompted for a table, type or select **CLIENTS** and pick your new CLIENTS form. *Paradox* will prompt you to position the CLIENTS form in the space you left blank for this purpose. Once this is done, press <**F2**> to save your work.

With this multitable form, you'll be able to add new clients in the middle of adding projects. If you're working in Edit mode, press <**F3**> to move the cursor from PROJECTS to CLIENTS; when you're finished adding a new client, press <**F3**> or <**F4**> to move the cursor back to the PROJECTS part of the form. If you're in Coedit mode, follow the same procedure with one exception: After adding a new client, press <**Alt**>-<**L**>, then <**F3**> or <**F4**> to return to PROJECTS. Unfortunately, using this form in Data Entry mode will only lead to frustration; when you're in the PROJECTS side of the form, *Paradox* won't know about the new records you've added to CLIENTS.

Q. *I'm using* DataEase *to manage my new list of business contacts, and I prefer all the names to be uppercased. Is there some way I can make sure that they're all entered that way?*

LEN MONROE
GIG HARBOR, WASHINGTON

A. It's pretty simple to ensure that all entries in a field are uppercase, once you find the place to do it. Start *DataEase* and open the data base that includes your CONTACTS form. From the main menu, press **1** to go to the Form Definition menu, then **2** to modify your form; select *contacts* (or whatever your form is called) from the resulting list. This will bring you to the Forms Design screen.

Move the cursor to the field in question and press <**F10**>. *DataEase* will now display the Field Definition screen. Move the cursor to the 'Derivation Formula' field and type **UPPER(***fieldname***)**, where *fieldname* is the title of the field you're currently defining. Make any other changes you want to this field definition, and press <**F2**> to return to the previous screen. Press <**F2**> again to save the form, **N** when *DataEase* asks whether you want to save the form under a new name, and <**Esc**> to return to the main menu. From now on, when you enter data in that field, it will initially appear on screen in whatever case your keyboard is in, but *DataEase* will automatically convert the text to uppercase when the cursor leaves the field.

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Celeste Robinson is an information systems consultant and the author of several data base how-to books.

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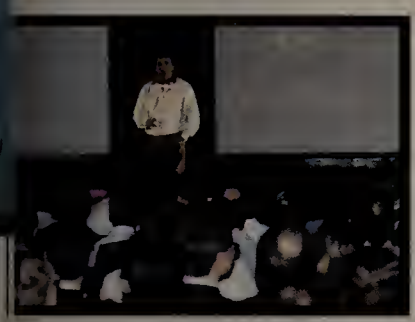

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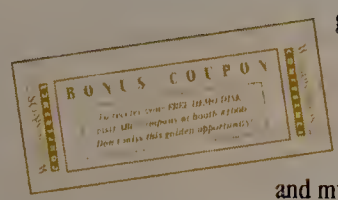

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PUBLISHING & PRESENTATIONS

BY RICHARD JANTZ

Expert advice for creating high-impact documents and presentations

How many columns should your newsletter have? Although a three-column layout is most common, a two-column format requires less planning and is easier to produce, making it a good choice for busy publishers. The trick with a two-column newsletter, where articles simply flow one after the other, is to keep the layout from becoming overly symmetrical and monotonous. Adding contrast makes a newsletter more readable.

To illustrate this principle, we've redesigned the first page of an 8½-by-11-inch, four-page newsletter published by the Todd Organization of Chicago. *The Todd Report* covers news about executive compensation programs and is distributed to thousands of corporate managers throughout the country. For this type of document and audience, a structured two-column format using justified type lends authority to the newsletter's no-nonsense material.

The basic problem with the original newsletter, however, is its lack of contrast. Crowded copy fills the page, leaving scant white space to invite the eye into the text. The headlines are too blocky and dense, and the pull quote doesn't stand out effectively from the surrounding text.

The goal of our redesign was to make the newsletter more visually appealing without changing its basic two-column format. To do this, we revamped the newsletter's nameplate, or banner, by incorporating the company's eye-catching logo and using reversed type—white letters on a black background—for the issue identification line. Moving the issue identification line closer to the publication title and slogan helped anchor the nameplate and separate it from the text.

Resetting the headlines in upper- and lowercase provides better contrast and makes them easier to read. To give the pull quote more impact, we placed it slightly in the left margin and used white space to separate it from the text. We also chose a different second article from the inside pages, one that included a bar chart, adding another much-needed graphic element to the front page.

Finally, we changed the paper stock. Instead of the original *Todd Report*'s dark-blue ink printed on plain gray paper, we recommended a paper with a texture or pattern, such as a speckled recycled stock. If your newsletter could use more visual variation, don't forget that changing your paper stock is an excellent way to add dramatic contrast at little or no additional cost.

Mail your publishing and presentation questions to Publishing & Presentations, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Publishing & Presentations; CompuServe, 7405,412; MCI Mail, PC World Editorial; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

Contributing Editor Richard Jantz is a computer publishing consultant in Berkeley, California. Larry Westdal, a graphic designer with Westdal Design Associates in Berkeley, California, also contributed to this article.

1 The publication's title and slogan are innocuously symmetrical in the original. Adding the company's lively logo makes the nameplate more dynamic and immediately calls attention to the page.

2 The original 16-point Helvetica Black Italic headline is increased to 22-point Helvetica Black. Adding white space above the head and setting it in upper- and lowercase, two columns wide, makes it easier to read and amplifies its importance.

3 Large capital letters, set two lines deep in 30-point Helvetica Black, serve a dual purpose: They add contrast to the page and help distinguish the entry point to each new article.

4 The centered pull quote is now flush left, increased from 10-point Helvetica Black Oblique to 12-point Helvetica Condensed Black Oblique. Moving it into the left margin creates a much stronger visual element on the page.

5 An article with a graphic is more visually interesting than an article without one. We selected a different article for the front page so we could position a strong graphic element to attract readers.

6 We differentiated secondary headlines from the main head by setting them slightly smaller (in 18-point Helvetica Black) and making them only one column wide.

7 Flush-left subheads produce a cleaner, more consistent look than centered ones.

8 Reversed type makes the line pop out and unifies it with the company logo.

AFTER

1

THE TODD REPORT

DEVELOPMENTS IN EXECUTIVE BENEFITS

PRODUCED BY THE TODD ORGANIZATION ■ VOLUME 7, NO. 2

8

2

Redeployment Stretches Benefits Budget

3

In the early years of the 1990s, it seems clear that U.S. business is proceeding cautiously. After the excesses of the 1980s, corporations now are insisting on a return to the basics. Particularly with so many disappointing interim earnings reports, the belt tightening and corporate overhead control of the past 12-18 months seem likely to continue for some time to come.

Even after significant cuts in overhead budgets in 1990 and 1991, there is a reluctance to increase these budgets at this time. Todd Organization consultants have found that corporate leaders want the highest quality programs practical, but would prefer to meet their needs by redeploying the resources already allocated in their current budgets.

Impact on Executive Benefits

These corporate budgetary pressures certainly extend to executive benefits. For many corporations, it has been several years since they have significantly improved their executive benefits. And during that same period, the performance of stock option plans, phantom stock plans, equity plans, and other wealth accumulation vehicles has been restricted by the effects of the recession on business and profits.

Because of this, even a modest improvement in an executive benefit today might well have a disproportionately beneficial effect on the morale of senior executives, most of whom must have doubts about their future wealth accumulation prospects. What's more, such enhancements can be accomplished within current budgetary restraints by redeploying already budgeted funds more cost-effectively. A good example is group life insurance.

4 ***"Executives end up with something extra at retirement."***

Virtually every corporation has a group life insurance program which provides term life insurance to its executives. In recent years, the value of this perquisite has grown until today $500,000 policies are not at all unusual. The executives have this insurance coverage until they retire or leave the company, and usually they pay nothing for it.

However, the executives do pay a price for this insurance. They don't pay their employers or the insurance company for this coverage, it's true, but they pay the IRS a substantial amount. The IRS considers that if the employer pays the premiums for life insurance above $50,000, the executive is receiving imputed income and must pay income tax on it. For an executive in his sixties, that involves a tax bite of several thousand dollars a year.

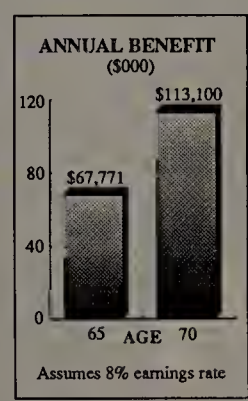
Real Costs of Group Life Insurance 7

That adds up. If a typical 45-year-old executive has this group term coverage until he retires at 65, he will pay the IRS $25,000 in income taxes on the premiums for $450,000 of insurance. And during this period, the corporation will be paying out $95,000 in premiums. That's a total of $120,000. Moreover, since only 13.6% of 45-year-old males are actuarily predicted to die before they they are 64, this insurance has a value of only $61,200 (13.6% x $450,000). This constitutes quite expensive protection.

continued on page 4

Bridge SERP Builds 401(k) Benefits 6

For very good reasons, the 401(k) plan has become the most popular qualified retirement plan. Today, the vast majority of major U.S. corporations offer these plans to their entire workforce.



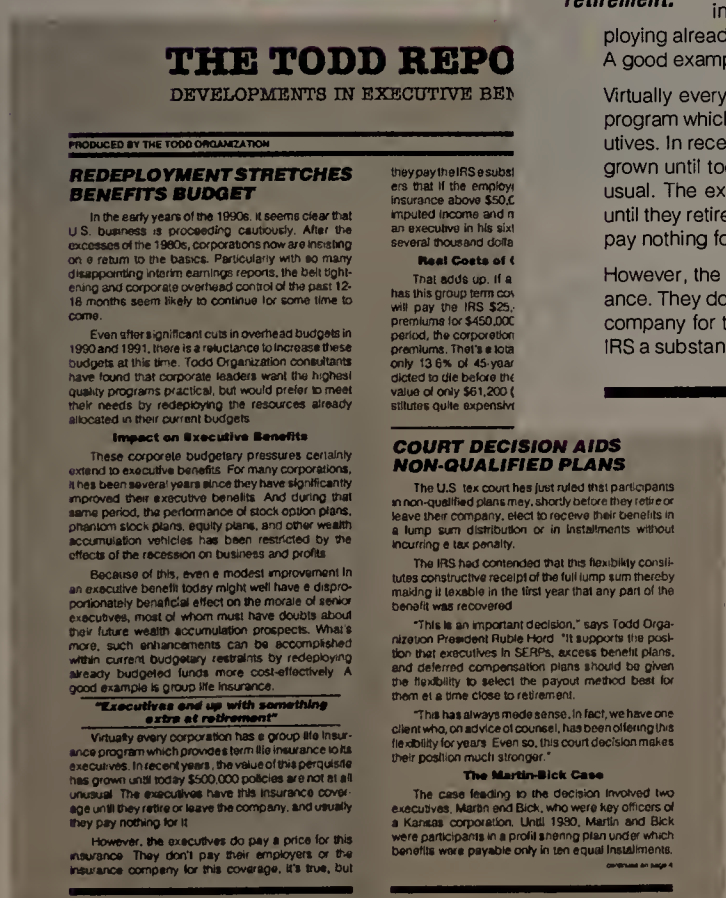
Effect on 401(k) benefit by deferring payout.

Despite rigid anti-discrimination rules, exectives can still gain significant benefits from 401(k) plans. If a 45-year-old executive contributes the maximum amount allowable to his 401(k) plan each year, and if his company matches 25% of his annual contributions, an 8% earnings rate would cause his 401(k) account balance to grow to $626,490 by the time he retires at age 65. This would be adequate to pay him an annual annuity of

continued on page 3

5

BEFORE



THE TODD REPO

DEVELOPMENTS IN EXECUTIVE BEN

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The U.S. tax court has just ruled that participants in non-qualified plans may, shortly before they retire or leave their company, elect to receive their benefits in a lump sum distribution or in installments without incurring a tax penalty.

The IRS had contended that this flexibility constitutes constructive receipt of the full lump sum thereby making it taxable in the first year that any part of the benefit was recovered

"This is an important decision," says Todd Organization President Ruble Hord "It supports the position that executives in SERPs, excess benefit plans, and deferred compensation plans should be given the flexibility to select the payout method best for them at a time close to retirement.

"This has always made sense. In fact, we have one client who, on advice of counsel, has been offering this flexibility for years Even so, this court decision makes their position much stronger."

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BY JUDY HEIM

On-line resources for business and professional users

Q. *Is it really necessary to turn off my modem and disconnect my PC and modem from the telephone during a thunderstorm?*

ANDREW DUGAN
BOWLING GREEN, OHIO

A. Leaving your PC on the phone during a thunderstorm is like using a popcorn popper in the bathtub: Errant volts shooting through the phone line can fry both your modem and your PC. What's worse, whether the PC is actually on the phone when lightning strikes doesn't make much difference, nor does it take a direct zap to render a modem senseless. Phone line disruption from a nearby ground strike is all it takes to turn your collection of costly, interconnected electronics into a mass of costly, interconnected toasted marshmallows.

Special phone-line surge protectors, available at office supply stores, offer some protection, as do power-strip surge protectors that include jacks for your phone—but they're hardly foolproof. (Your phone company may say they have special antilightning talismans screwed into their switching equipment that will protect your hardware, but these aren't foolproof either.) The best thing to do when clouds start rumbling is unplug the phone cord from the modem as well as the modem from the power outlet. You'd be wise to unplug the PC as well.

Q. *I want to send an E-mail message to a friend on CompuServe, but I don't know his user ID. Is there any way I can look it up?*

LARRY SUNDANCE
BAYONNE, NEW JERSEY

A. Yes, there is: Type **GO DIRECTORY**. After offering a few basic options, the service will ask for a last name; once given, it will list all the members that match. If there are a lot of members with that name, CompuServe will ask for a first initial, too. You can also search for company names.

Q. *Our rental car agency is planning to purchase a network to link four of our local outlets. We talked to four network consultants about this. Three of them told us that we could use dial-up phone lines, but the fourth said that we needed leased lines. What do you recommend?*

TED LANGO
MILWAUKEE, WISCONSIN

A. Expensive, privately leased phone lines are much faster than dial-up, public lines, so you have to ask yourself how much you're willing to pay for performance. The top speed at which you can communicate safely on a regular phone line is 14.4K baud, while leased lines let you cruise at 56K baud and up. But leased lines cost $2000 to $2500 each to install, plus $500 to $800 a month in maintenance fees. Compare that to a conventional phone bill, especially one devoted to local calls. In other words, unless you're running a large-scale, full-fledged network across long distances and have a large-scale, full-fledged budget to match, warp-speed leased lines don't make sense.

Are dial-up connections as clean as leased lines? Contrary to myth, yes, thanks to today's error-correcting modems. If you're still uneasy about using modems and dial-up lines, give them a shot for a month: Modems don't cost much.

If you go with public lines, you have to decide whether to keep the phone links between your network sites alive and open 24 hours a day. This gives you real-time contact, but your local phone company may sock it to you in extra charges. If your phone company bills calls by duration, or if your outlets are scattered enough to require toll calls, you'll save money with a network where the nodes dial each other up periodically to swap data.

Lucky for you, the Milwaukee area has no intramunicipality-call tariffs or call-duration billing. You'll be able to keep all your nodes continuously connected around the clock for only $21.16 per phone line per month. What a deal! Doing the same in, say, New York, would cost $498.04 per phone line plus tax.

(As we went to press, Mr. Lango informed us that he chose to go with dial-up, public lines and that they're working great.)

Mail your communications questions to Communications Q&A, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Communications Q&A; CompuServe, 75300,713; Internet, 3127737@mcimail.com; GEnie, JUDY.HEIM; MCI Mail, 312-7737; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

Judy Heim is a contributing editor for PC World.

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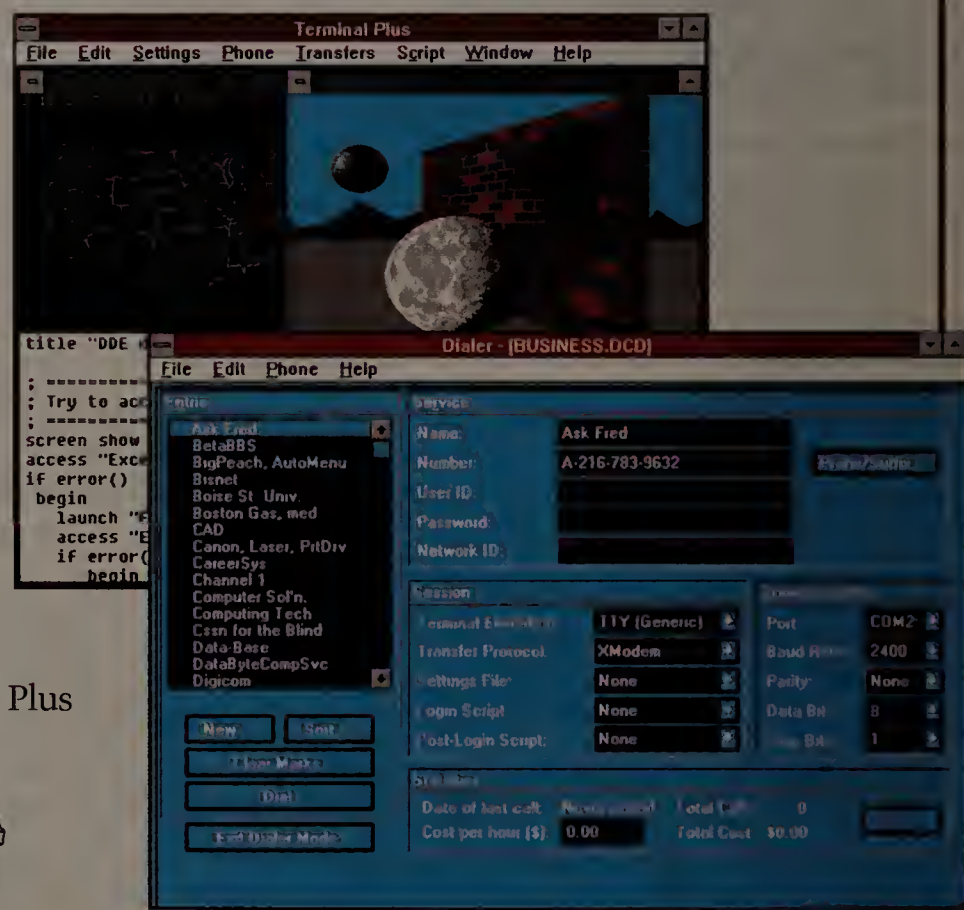

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WINDOWS WORKSHOP

BY SCOTT DUNN

Practical answers to your questions about Windows

Q. *When I first installed* Windows, *it started with the Program Manager window open. I have since installed utilities such as* hDC FirstApps *and* PC Tools 7.1. *Now Program Manager comes up as an icon at the bottom of the screen (along with various icons from my utility programs). How can I keep the utilities displayed as icons but have Program Manager's window open when I start?*

CHARLOTTE CHAMITOFF
DERBY LINE, VERMONT

A. In *Windows 3.0,* Program Manager always begins as an open window unless an application is listed on the "run=" line of the WIN.INI file, in which case, Program Manager will appear as an icon. Apparently, one or more of your utilities was added to the "run=" line during installation.

To fix this problem, make a backup copy of WIN.INI, then open that file in Notepad or, even easier, in your System Configuration Editor (SYSEDIT). To get to SYSEDIT, select *File•Run* in Program Manager, type **SYSEDIT**, then click once on the WIN.INI window to bring it to the front for editing. Look for the line beginning "run=" near the beginning of the file. Select everything following the equal sign, cut it, and paste it at the end of the "load=" line. (Make sure there is a space between the portion you paste and anything that was previously on the "load=" line.) Save WIN.INI, exit, and restart *Windows.*

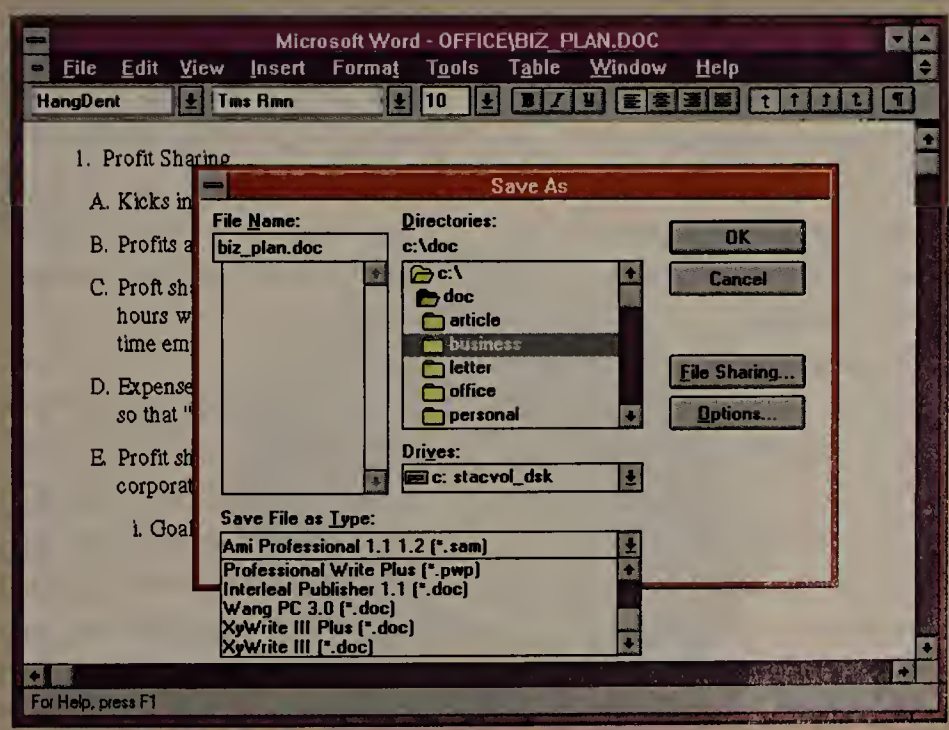
If you upgrade to *Windows 3.1,* you'll no longer need to list start-up programs on the "run=" or "load=" lines. You can just drag icons into Program Manager's StartUp group, which will launch them automatically. If for some reason you want Program Manager to start minimized, simply select *Minimize on Use* from the Options menu.

Q. *I love being able to paste* CorelDraw 2.0 *pictures into* Word for Windows 2.0. *But now that I've got* Windows 3.1, *I've discovered object linking and embedding (OLE), and I'm envious.* Word for Windows' *own drawing program lets me "embed" pictures for easy updating, but it isn't powerful enough for what I need to do. Is there some way around this, or will I have to wait until my boss springs for a different drawing application?*

MARIAN WALKER
VIENNA, VIRGINIA

A. You can simulate OLE's capabilities with applications that aren't necessarily OLE-aware, though only you can

Windows Toolbox



The latest upgrade of *Windows Word for Word,* the popular file-conversion utility, now works with *Word for Windows.* Installation is a breeze: Just copy the desired DLL files to your *Word for Windows* directory and see the new filters appear in the Open and Save As dialog boxes. *Windows Word for Word* supports more than 30 file formats and retails for $79.95. Users of other versions may upgrade for $39.95 from Mastersoft, Inc., 6991 E. Camelback Rd. #A-320, Scottsdale, AZ 85251; 800/624-6107, 602/970-0800.
Reader service no. 801

ANTHONY RUSSO

decide whether it's going to be worth all the trouble you have to go through.

The solution rests with Object Packager, a utility that comes with *Windows 3.1*. To create an embedded *CorelDraw* drawing for *Word for Windows* or any other OLE "client" application, first create your drawing in *CorelDraw*. Save the file, then select and copy it to *Windows'* Clipboard. Next, start *Word for Windows*, open your document, and position the cursor where you want your picture to appear. From the Insert menu, choose *Object*. In the Object dialog box, choose *Package* and select *OK*. This launches Object Packager.

From Object Packager's File menu, choose *Import*. Select your picture's file name, then select *OK*. The Object Packager displays a *CorelDraw* icon in the Appearance window (left) and 'Copy of YOURFILE.CDR' (or whatever the name) in the Content window (right).

Click in the Appearance window, then choose *Paste* from the Edit menu (or press <Shift>-<Insert>) to paste your *CorelDraw* picture into this window. Your object is now complete, but to finish the job, you still need to embed the object in your word processor. Since you launched Object Packager from *Word for Windows*, you simply choose *Update* from Object Packager's File menu. Then close Object Packager.

(Tip: If you launched Object Packager from Program Manager, the Update command is grayed out. No problem. Just choose *Copy Package* from the Object Packager's Edit menu, then paste your object anywhere you like in your document.)

Now suppose you need to revise the picture. Just double-click the image in your document to launch *CorelDraw* with your picture loaded and ready to be edited. Make your changes and, as before, save the file, select it, and copy it to the Clipboard. Then exit.

With the picture still selected, choose *Package Object* from *Word for Windows'* Edit menu. The Object Packager opens with your picture loaded. Click in the Appearance window and choose *Paste* from the Edit menu (or press <Shift>-<Insert>). Then exit Object Packager, which will prompt you to update your document; click *Yes*.

You may find it more convenient to choose *Word for Windows'* Package Object command *before* you edit the *CorelDraw* picture. Once Object Packager is launched, you can access your *CorelDraw* picture simply by double-clicking the file name in Object Packager's Content window. Then save and copy (in *CorelDraw*), and paste into the Appearance window (in Object Packager). Finally, exit and update as explained before.

One note: When you open your picture from within *Word for Windows* (or Object Packager), don't expect the file name to be the same as the original. Object Packager creates a *copy* of your picture. The original is independent of further updates, while the new copy is the one that's embedded in your *Word for Windows* document.

If all these steps seem like an annoyance, you can automate repetitive steps with a Recorder macro. Your alternative is to get the boss to shell out for a drawing application that supports OLE. And if you want to stick with *CorelDraw*, there's good news. Version 3.0, a $149 upgrade, has been released, and it's an OLE server.

Q. *When I try to run certain DOS applications in a window in 386-enhanced mode, I get a message: 'You cannot run this application in a window or in the background'. Other applications work just fine in a window. Any suggestions?*

MUKUND S. CHIPLUNKAR
DUKHAN, QATAR

A. The problem is that your DOS program is using VGA or EGA graphics, which *Windows 3.0* cannot display in a window. You have three alternatives. First, you can switch to full-screen display by pressing <Alt>-<Enter>. To make sure the program runs full screen every time, launch the PIF Editor, open the PIF that starts the application in question, and select Display Usage's *Full Screen* option.

If you insist on running a DOS application in a window, consider dropping down to text mode (as opposed to graphics mode) if your application supports it. Otherwise, check to see whether your application supports CGA graphics mode, which is compatible with a windowed DOS session. Consult your program's documentation to find out how to change this setting.

Finally, consider switching to *Windows 3.1*. Your success will depend on your video board and driver, but you'll stand a much greater chance of running your VGA or EGA graphics in a window.

Q. *I recently upgraded to* Windows 3.1, *and suddenly none of my Adobe fonts seem to be available in any of my applications. I checked the* Adobe Type Manager *control panel to make sure I hadn't somehow deleted my fonts, but fortunately they all still seem to be there. What went wrong?*

DOUG KEOGH
NEW YORK

A. Not to worry. You probably inadvertently checked a box that tells applications to display only *Windows 3.1*'s own TrueType fonts. Double-click on *Fonts* in the Control Panel, then select *TrueType*. Click the 'Show Only TrueType Fonts in Applications' box to deselect it. When you return to your applications, your Adobe fonts will magically reappear.

Send your Windows *questions to* Windows Workshop, PC World, *501 Second St., San Francisco, CA 94107; or send them electronically to PC World Online, Windows Workshop; CompuServe 74055,412; MCI Mail, PC World Editorial; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

Scott Dunn is coauthor of 101 Windows Tips *(Peachpit Press, Berkeley, California, 1992).*

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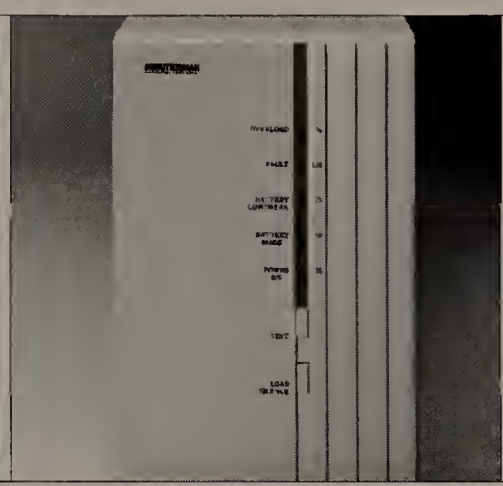

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USER GROUP TIPS

Helpful hints from members of the nation's user groups

Hardware Warnings

If you ever upgrade your system's RAM by adding SIMMs, a few simple rules and precautions will make everything go smoother.

Before you change any jumpers or DIP switches, jot down the original settings on a piece of paper. That way, if something goes wrong, you can return your computer to its original state.

Once you've installed the hardware, you'll have to use your computer's setup program to reconfigure your system so it can use the extra memory. Since setup programs vary, I can't tell you exactly how to do this, but I can tell you that you'll need to know precisely how much extended memory you now have. Get that number by subtracting 640K from your total amount of RAM.

Remember, however, that a megabyte is equal to 1024K, not 1000K. For instance, if you have 2MB of RAM, you will have 1408K of extended memory (1024 times two, minus 640).

JOHN B. WOODYARD II
GREAT BASIN PC & HACKERS

Better Quotes in WordPerfect

I need great-looking documents with great-looking quotation marks. Although *WordPerfect 5.1*'s extended character set has opening and closing quotes, they aren't of very good quality.

I discovered that in a proportional font, two single quotes make a great-looking double quote. What's more, what you see on screen, while not pretty, looks a good deal more like quotes than the square boxes you get with the extended character set.

To create an opening quotation mark, press the single open-quote key (on most keyboards, it's left of the 1) twice. For a closing mark, press the single close quote, or apostrophe, twice. The resulting two-character marks won't look good in every font (they look horrible in Courier and other monospaced fonts), but they look great in many of them.

BETTY SHERWOOD
CHICAGO COMPUTER SOCIETY

The Excel Formula

A few tricks make it a breeze to debug formulas in *Excel*. If you double-click on a cell containing a formula, for instance, *Excel* will select all the cells the formula refers to, providing an opportunity to catch any additional errors.

JULIA GORTON

Double-clicking won't help you catch a '#NAME?' error. *Excel* produces this message when either a range or function name is misspelled in your formula. But in a long formula, it's difficult to quickly identify which name is wrong.

With function names, at least, there's an easy way to catch the error. When *Excel* evaluates a formula, it automatically converts all correct function names to uppercase. Therefore, if you type your function names lowercase, all you need do when you get a '#NAME?' error is look for the function that's still lowercase. You'll be able to see at a glance which one is misspelled.

JAN ALTMAN
STANFORD/PALO ALTO PC USERS GROUP

Free PageMaker Condensation

What do you do if your *PageMaker 4.0* document needs the Helvetica Condensed typeface but you don't have it? Here's what: If you have plain old Helvetica, use *PageMaker*'s Set Width command to turn it into a dead ringer for Helvetica Condensed.

Select *Type • Font • Helvetica*, then choose *Type • Set width • Other*. Type **83** as your percentage and press **<Enter>**. The resulting text may look weird on screen, even when you're using *Adobe Type Manager*, but it will look great when it comes out of the printer. This trick works in all type sizes, with roman, italic, and boldface print.

HOWARD WEXLER
SAN ANTONIO PC USERS GROUP

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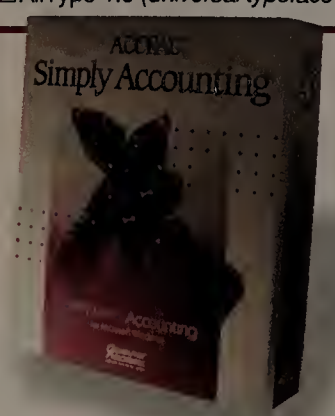

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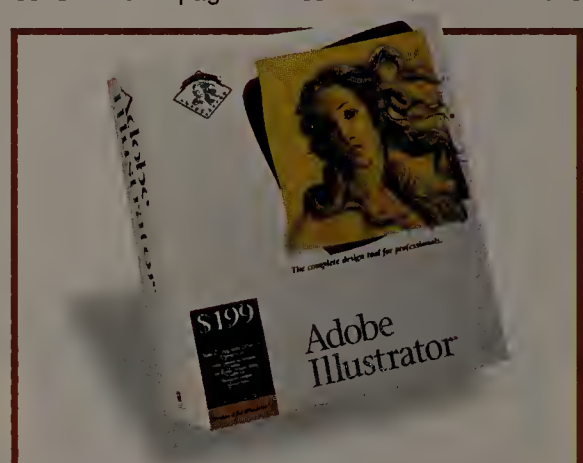

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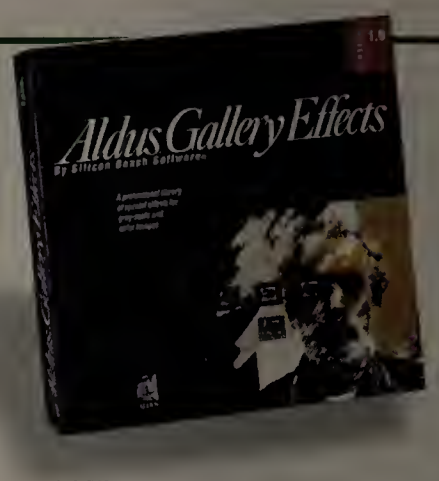

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5974 ▣DOSFax PRO 2.0..... 49.
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Fifth Generation Systems ... NCP
7725 ▣Direct Access 5.1..... 64.
3950 ▣Fastback Plus 3.0..... 119.
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6188 Ⓡ FoxPro 2.0 ..... 479.
Gibson Research ... NCP
9832 ▣SpinRite II 2.0..... 64.
Hayes ... NCP
7983 ▣Smartcom EXEC 2.1 ..... 75.
Helix Software ... NCP
9627 ▣Netroom 2.1..... 52.
Hewlett-Packard ... NCP
8101 ▣NewWave 4.0 ..... 109.
IBM ... NCP
2666 ☐DOS 5.0 Upgrade..... 59.
7303 ☐OS/2 2.0 Upgrade from DOS..... 95.
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5696 ▣Squeegee for Windows ..... 42.
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MECA ... NCP
3978 ☒ One-Write Plus Accounting 3.0 ... 79.
4880 ☐ One-Write Plus Accounting Works 3.0 119.
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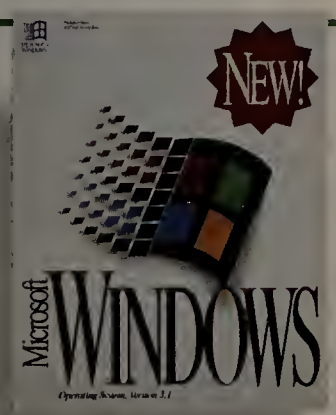

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8137 ☐ Office 2.5 for Windows ... 479.
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1624 ☒ Visual Basic 1.0 ... 129.
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4925 ☒ PC-Kwik Power Pak 2.1 w/Power Disk 79.
Niles & Associates ... NCP
3880 ☒ EndNote Plus 1.0 ... 149.
Nolo Press ... NCP
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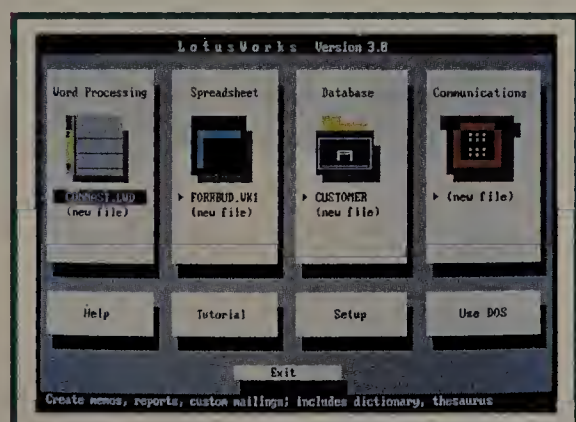

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5902 ☒ PC Globe 5.0 ... 39.
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Spinnaker ... NCP
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3524 ☒ Stacker 2.0 w/16-bit Coprocessor Card 185.
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6174 ▣The Animation Studio ..... 79.
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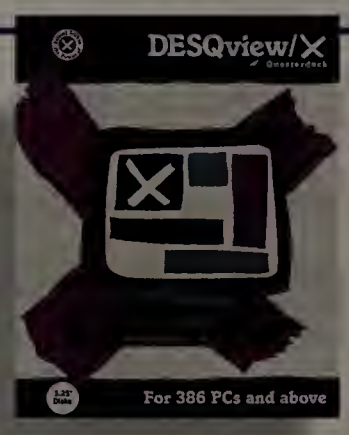

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7108 Smart UPS 400 ..... 339.
7105 Smart UPS 600 ..... 439.
3819 Back-UPS 250..... 115.
3858 Back-UPS 400..... 179.
7107 Back-UPS 450..... 215.
3823 Back-UPS 600..... 295.
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2480 MousePen Pro PC..... 62.
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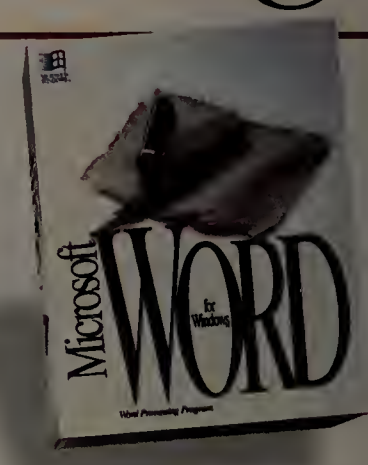
9821 VGA Basic-16 *(640 x 480, 16 colors)*..... 65.
9985 VGA Integra *(1024 x 768, 16 colors)*..... 84.
2706 VGA Wonder XL *(with 1 MB)*..... 149.
2382 Graphics Vantage VGA *(with 1 MB)*..... 225.
9822 8514/Ultra *(with 1 MB) (requires VGA)*. 399.
2012 Graphics Ultra with VGA *(with 1 MB)*... 479.
9620 9600etc/e Modem..... 285.
3902 Stereo•F/X *(sound board)*..... 109.
3900 VGA Stereo•F/X *(w/512K, upgrd. to 1 MB)*215.



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6999 I/O Board for Microchannel *(S/S/P)*..... 89.
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8381 SuperVGA *(1 MB, 1024 x 768)*..... 115.
3859 2400 Internal Modem *(V.42, MNP Level 5)* 79.
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7400 2 Position Laser Compatible Switch Box 109.
Brown-Wagh ... 1 year
8578 Creative Labs Sound Blaster..... 109.
2336 Creative Labs Sound Blaster Pro..... 189.
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7894 BJ-10ex Printer *(4.6 lb.)* ..... 329.
6679 BJ-20 Printer *(includes sheet feeder)*... 429.
7897 BubbleJet Ink Cartridge *(BJ-10ex)* ..... 23.
7896 BJ-10ex Sheet Feeder ..... 75.
Cardinal ... 1 year
2719 MB2296SR Internal Send/Receive Fax.. 95.
1197 386-SX-25 Motherboard 0K ..... 239.
1480 Cardinal 9600 Internal Modem ..... 265.
2783 Cardinal 9600 External Modem..... 299.
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6138 SuperMath 387DX-33..... 155.
6126 SuperMath 387SX-25..... 125.
CoStar ... 1 year
1947 LabelWriter II ..... 185.
COVOX ... 1 year
5543 Sound Master II ..... 145.
Curtis ... lifetime
1708 Ruby-Plus SPF-2+..... 59.
7358 Command Center SPF-4..... 85.
Cyrix Corporation ... 5 years
MATH COPROCESSORS
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9876 FasMath 83D87-33..... 169.
9877 FasMath 83S87-16 *(SX compatible)*..... 99.
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5552 ▣FasPro SX25 *(incl. Quattro Pro 3.0)*.. 215.
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6945 Stealth Hi-Color ..... 265.
6947 SpeedStar Hi-Color ..... 175.
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522 OPTIMA 96 Modem ..... 389.
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884 Pocket Edition 2400 ..... 119.

Hewlett-Packard ... 1 year
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994 SatisFAXtion Model 400 ..... 399.
995 SatisFAXtion Model 400E ..... 449.
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003 ▣FAXability Plus OCR *(software)* ..... 165.
076 Snap-In 386 *(for PS/2 50/60 & IBM AT)* 389.
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021 EtherExpress 16 TP ..... 129.
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311 MasterStand ..... 59.
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518 101 Plus Keyboard ..... 99.

Logitech ... limited lifetime
996 Trackman2 *(combo)* ..... 84.
343 Trackman Portable ..... 99.
975 ScanMan 256 ..... 269.
295 MouseMan *(combo)* 69. 9766 *(cordless)* 89.

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5638 MultiMedia PC Upgrade Kit 16 ..... $969.
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5637 ProAudio Spectrum 16 ..... 219.

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6576 P296FMV Fax Modem *(9600 baud V.42)* 479.
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2898 Mouse with Windows 3.0 *(bus or serial)* 149.
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2763 MicroTRAC *(serial & PS/2 interface)* ..... 57.
6330 PC-TRAC Trackball *(PS/2)* ..... 75.
6007 PC-TRAC Trackball *serial* ..... 75.
6008 PC-TRAC Trackball *bus* ..... 89.

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5613 Little Mouse/PC *(serial)* ..... 65.
5979 NewPoint ..... 79.

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6779 25 Cartridges in One! *(LJ II, IID, IIP, III, IIID)* 269.
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3388 Pacific Page PE w/ 2 MB *(LJ IIP, III)* .... 399.
5729 ProTracer *(personal CAD printer) (1 yr.)* 1099.

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8993 2400 Baud Internal Modem *(V.42 bis)*.. 115.
8994 2400 Baud Exernal. Modem *(V.42 bis)* 125.
8132 PM2400 Pocket Modem ..... 109.
2266 PM9600 Internal Modem ..... 275.
7934 PM9600SA Modem ..... 289.
2264 PM2400FX96 *(int. modem/fax)* ..... 95.
1344 PM2400FX96SA *(ext. modem/fax)* ..... 99.
3803 PM14400FX96 *(int. modem/fax)* ..... 359.
2425 PM14400FXSA *(ext. modem/fax)* ..... 399.

Prometheus ... 2 years
1222 ProModem Ultima Home Office ..... 489.

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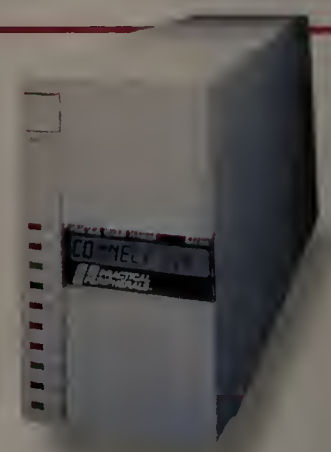

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6315 Fax Line Manager 203 ..... 139.
6009 OmniLink Laser ..... 425.
TheComplete PC ... 2 years
6069 TheComplete Modem Plus ..... 95.
5828 TheComplete Communicator ..... 299.
Tripp Lite ... 2 years
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6200 Isobar 6-6 *(6 outlets, Gold Seal Warranty)* 59.
6506 BC1250 LAN Power Backup ..... 499.
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9768 VRAM II VGA 1 MB ..... 329.
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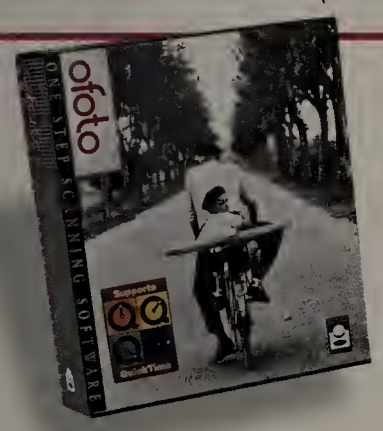

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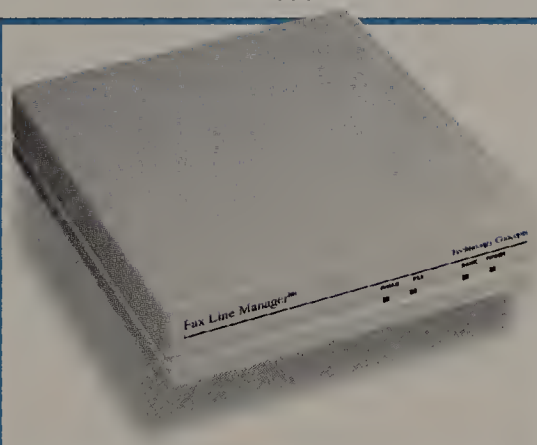

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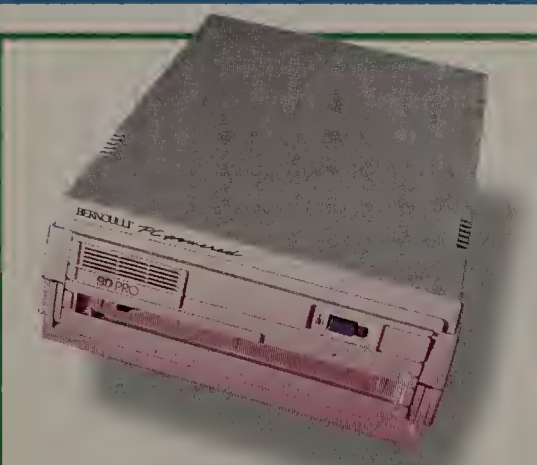

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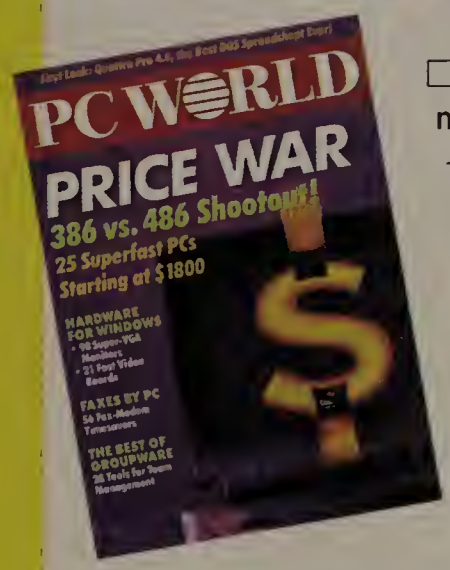

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	All	Some	1	2	3	4	5
Sample	◉	○	○	○	○	○	◉
In This Issue (page 13)	○	○	○	○	○	○	○
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Compaq Gets Budget Minded (page 50)	○	○	○	○	○	○	○
Zeos and PC Brand Adopt 486SLC (page 52)	○	○	○	○	○	○	○
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Optical Drives Reach a Pinnacle (page 58)	○	○	○	○	○	○	○
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Industry Outlook (page 113)	○	○	○	○	○	○	○
PC World Marketplace (page 120)	○	○	○	○	○	○	○
486SX PCs: Double-Time Performers (page 124)	○	○	○	○	○	○	○
Personal Time Managers (page 158)	○	○	○	○	○	○	○
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Paradox for Windows (page 187)	○	○	○	○	○	○	○
Buyers' Guide: 200MB Hard Disks (page 204)	○	○	○	○	○	○	○
Customizing Windows (page 217)	○	○	○	○	○	○	○
Buyers' Guide: Label Printers (page 225)	○	○	○	○	○	○	○
Software for the Professions (page 230)	○	○	○	○	○	○	○
The Help Screen (page 241)	○	○	○	○	○	○	○
Spreadsheets (A..Z) (page 249)	○	○	○	○	○	○	○
Word Processing Clinic (page 255)	○	○	○	○	○	○	○
Data Basics (page 263)	○	○	○	○	○	○	○
Publishing & Presentations (page 266)	○	○	○	○	○	○	○
Communications Q&A (page 269)	○	○	○	○	○	○	○
Windows Workshop (page 271)	○	○	○	○	○	○	○
User Group Tips (page 275)	○	○	○	○	○	○	○
Star-Dot-Star (page 285)	○	○	○	○	○	○	○
Instant Reference Card: Excel 4.0 (page 287)	○	○	○	○	○	○	○
The Home Office (page 326)	○	○	○	○	○	○	○
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How would you like to see PCs categorized in *PC World* reviews? (See *In This Issue*, page 13.)

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A Message From the Top

When you work in a *Windows 3.0* DOS session for extended periods, you might forget that *Windows* is running and type WIN to enter it again, starting one *Windows* session inside of another. In January's "50 Tips for DOS and Windows," the Microsoft Technical Support staff offered a solution to this problem: Change your prompt. But the two-line prompt their batch file creates results in a screen that scrolls one extra line for every command, wasting space.

My solution is a variation on that tip: Use ANSI.SYS parameters to put a reminder in one place on the screen. This also changes the foreground and background colors to make the screen more vivid.

For this screen to work, you must have the line DEVICE=C:\DOS\ANSI.SYS in your CONFIG.SYS file. Then, rather than a standard DOS session, run DOS.BAT [see **LISTING 1**] to use the DOS prompt in *Windows*.

STEVE JOHNSON
POWDER SPRINGS, GEORGIA

Editor's note: Mr. Johnson's screen is not needed in Windows 3.1, *which won't let you load* Windows *within* Windows, *but his tip can save a lot of confusion in* Windows 3.0 *or most other places where you might shell out of a program. Check out "Retrieving Your Precious Prompt,"* Star-Dot-Star, *December 1991, to see how a batch file can change the prompt, enter an application, and then change it back again when you exit. That batch file and this one can be easily combined.*

You can also play with the PROMPT command to change the look of your screen. For instance, if you change the batch file's first line to **PROMPT $e[1;33;44m$pge[1;31;44m$e[s$e[1;1H$e[KWindows is active$e[1;69Hte[1;3744m$e[u** *(note that there are no blank spaces here except the two in the 'Windows is active' statement), you can also display the time.*

Frustration-Free Formatting

I've discovered an undocumented option, /AUTOTEST, for the DOS FORMAT command. By bypassing the Volume label and Format another diskette prompts (it assumes the negative for both), /AUTOTEST lets you format disks with less input. There's one drawback: /AUTOTEST doesn't work with DOS 5.0's /Q (quick) option.

VINAY MEHTA
LENNOXVILLE, PQ, CANADA

Editor's note: The /AUTOTEST option is available in DOS 4.0 and later. Because it lets you bypass the prompts, /AUTOTEST is extremely handy for formatting a disk from a batch file, or if you simply want to format a single disk with no questions asked.

Batch Files that Loop the Loop

The FOR statement makes DOS run the same command on a list of files. For instance, you might type **FOR %F IN (*.DOC *.TXT) DO TYPE %F** to display every DOC and TXT file in the current directory. The trouble is that FOR can send only one command to all its listed files. If you want to list *and* copy all the DOC and TXT files, forget it. FOR isn't intended to help you run a loop.

I've discovered a solution. You can create a batch file that recursively calls itself and then jumps to a subroutine within itself every time FOR acts on a file. An example, FORTEST.BAT [see **LISTING 2**], is attached.

MICHAEL SIGMUNDT
WILLOWDALE, ONTARIO, CANADA

Editor's note: To see how this works, simply run **FORTEST** *at the DOS prompt. Note how the 'ECHO Once' and 'ECHO Twice' commands (these substitute in this example for whatever real commands you may need) work on each file in the directory.*

This trick essentially allows you to implement a subroutine—something DOS's batch language can't normally do. (DR DOS and most third-party shells can.) A special value of the first parameter acts as a signal to the batch file, which can jump to the subroutine code on entry. Note Mr. Sigmundt's clever use of the SHIFT command to

```
PROMPT $e[1;33;44m$p$g$e[1;31;44m$e[s$e[1;62HWindows is active.$e[1;37;44m$e[u
CLS
@COMMAND.COM
```

ANTHONY RUSSO

LISTING 1: The PROMPT command in this batch file puts a reminder message in a fixed place on your screen.

```
@ECHO OFF
IF "%1"=="#LOOP#" GOTO LOOP
ECHO This is the beginning....
FOR %%F IN (*.*) DO CALL FORTEST.BAT #LOOP# %%F
ECHO This is the end....
GOTO END

:LOOP
REM Subroutine portion here
SHIFT
ECHO Once with %1
ECHO Twice with %1

:END
```

LISTING 2: This sample batch file uses the DOS FOR command to run a subroutine on multiple files. The 'ECHO . . . with %1' commands represent the looping routine.

eliminate the special parameter once the subroutine is entered.

Printing via Sneakernet

If you don't own a good graphics printer but have access to one elsewhere (say, at a local copy shop), *Windows* provides a nifty, little-known way to take your formatted document, on a floppy, to another computer for printing. The other computer doesn't need to have your application or even *Windows*.

First, set up a printer driver that will send its output to a file: Select *Printers* from the Control Panel's window, then select *Add;* a list of printers will appear. Select the one you'll be printing to (not the one, if any, attached to your computer), then select *Install.* Follow the prompts for installing the printer from the *Windows* setup disks. Once your new printer is in the Installed Printers list, highlight it and select *Connect.* Scroll down through the resulting list of ports to select *FILE:*. Exit the Printers window and the Control Panel.

Now, every time you use *File • Print Setup* to select your nonexistent printer, and then print from any *Windows* application, *Windows* will first ask for a file name. Once you've given it, *Windows* will send all the control codes and data to the file just as if it were a printer.

To print your document, take the output file on a floppy to the computer with the printer. Print with a simple command from the DOS prompt: **COPY /B A:***filename* **LPT1:**. The /B switch makes sure that binary control codes are preserved. You may need to replace LPT1: with another port address and A: with another floppy drive letter.

This procedure has a few limitations. First, make sure you stick to fonts that are in the printer. If you use *Adobe Type Manager,* make sure that *ATM*'s 'Use Pre-built or Resident Bitmap Fonts' option is turned off.

Second, you may find that your *Windows* output file is larger than the floppy can hold. Most *Windows* applications allow you to select a range of pages to be printed, so you can easily create a number of smaller output files if one file is too big with your full document.

STEVEN FOX
CHUNG HO CITY, TAIPEI HSIEN, TAIWAN

Editor's note: You'd have to print a very large file to overflow a floppy—but if you do encounter this problem, here's another way to handle it: Because printer control codes contain a great deal of redundancy, compressing a print file with PKZIP *(or any other compression utility) will reduce the size of the file by as much as 80 percent, letting you get up to five times the output on a single floppy. You can then use PKUNZIP's -C (Console) switch to direct the output to the printer as the file is decompressed: The command* **PKUNZIP -C** zipfile.**ZIP > LPT1:** *will unzip a file directly to your printer.*

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BASICS: EXCEL 4.0

In *Excel*, unlike in *1-2-3*, you generally select the area you want to change, then choose the command for changing it. Click the right mouse button to bring up a menu, near the mouse pointer, of common tasks for the current selection. Click OK or press **<Enter>** to finish most tasks.

THE STANDARD TOOLBAR

The default buttons on the Standard toolbar provide easy, mousable access to common tasks. The bar is located directly below the menus, but if you wish, you can move or hide it. You can also change its buttons or display additional toolbars. To use a tool on the toolbar, click on the appropriate button.

Button	Task	Keyboard equivalent
	Create worksheet	**<Shift>-<F11>**
	Open file	**<Ctrl>-<F12>**
	Save active file	**<Shift>-<F12>**
	Print active file	**<Ctrl>-<Shift>-<F12>**
Normal	Select style	**<Ctrl>-S**
Σ	Enter SUM() function with proposed range	**<Alt>-<Equal>**
B	Make selection boldface	**<Ctrl>-B**
I	Italicize selection	**<Ctrl>-I**
A	Enlarge selection's font size	**<Ctrl>-P**Size, select new size
A	Shrink selection's font size	**<Ctrl>-P**Size, select new size
	Left-align selection	Format•**A**lignment•**L**eft
	Center-align selection	Format•**A**lignment•**C**enter
	Right-align selection	Format•**A**lignment•**R**ight
	Center active cell's text across horizontal selection	Format•**A**lignment•Center **a**cross selection
	Apply last-used autoformat to range	Format•AutoFor**m**at, select format
	Apply border around selection	**<Ctrl>-<Shift>-&**
	Apply border to bottom edge of each cell in selection	Format•**B**order•**B**ottom
	Copy selection to Clipboard	**<Ctrl>-C** or **<Ctrl>-<Insert>**
	Paste format from Clipboard to selection	**E**dit•Paste **S**pecial•Formats
	Create chart, with *Excel* prompting you through each step	none
	Bring up context-sensitive help pointer	**<Shift>-<F1>**

DATA ENTRY

You can enter numbers, formulas, or text into any cell in a worksheet. Formulas normally begin with **=**, but you can also use **+**, **-**, or **@**.

Fill range with same values or formulas	Type value in first cell, drag fill handle (lower right corner of cell selection box) across desired range
Fill range with incremental labels (months, weekdays, and so on)	Type starting value in first cell, drag fill handle across desired range
Fill range with linear values	Type starting values in first two cells, drag fill handle across desired range
Fill cell with repeated character(s)	Type character(s), **<Enter>** Format•**A**lignment•**F**ill
Copy current date to formula bar	**<Ctrl>-<Semicolon>**
Copy current time to formula bar	**<Ctrl>-<Shift>-<Colon>**
Copy formula from cell above to formula bar	**<Ctrl>-<Apostrophe>**
Copy value from cell above to formula bar	**<Ctrl>-<Shift>-<Quote>**

COPY, MOVE, AND REARRANGE

Add noncontiguous selection(s)	**<Shift>-<F8>**, make additional selection(s), **<Esc>**; or press **<Ctrl>** while making additional selection(s)
Turn on drag-and-drop capabilities	**O**ptions•**W**orkspace•Cell **D**rag and Drop
Move selected range, overwriting target range	Point to selection border, drag, drop
Move selected range, moving target range	Point to selection border, hold down **<Shift>** while dragging and dropping
Copy selected range, overwriting target range	Point to selection border, hold down **<Ctrl>** while dragging and dropping
Copy selected range, moving target range	Point to selection border, hold down **<Ctrl>-<Shift>** while dragging and dropping
Change selected formulas to values	**<Ctrl>-C**; or **<Ctrl>-<Insert>**, **E**dit•Paste **S**pecial•**V**alues
Delete selected row(s)/column(s)	**<Ctrl>-<Hyphen>**
Insert selected number of row(s)/column(s)	**<Ctrl>-<Shift>-<Plus>**
Set width of selected columns to each column's best fit	Double-click on right edge of any selected column header
Hide selected row(s)	**<Ctrl>-9**
Hide selected column(s)	**<Ctrl>-0**
Unhide row(s) within selection	**<Ctrl>-<Shift>-(**
Unhide column(s) within selection	**<Ctrl>-<Shift>-)**

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PC WORLD

Instant Reference Card #27

For use with PC World Instant Reference Card Portfolio

ADVANCED: EXCEL 4.0

TOOLBARS

The Standard toolbar is one of nine you can bring up and place anywhere on screen. The other toolbars are for specific jobs (charts, formatting) or backward compatibility with *Excel 3.0*.

Display toolbar	**O**ptions•**T**oolbars, select toolbar, **S**how
Attach toolbar to side of screen or window	Drag toolbar to side of screen or window
Turn toolbar into free-floating window	Drag toolbar away from side of screen or window
Add existing tool to toolbar	Display toolbar, **O**ptions•**T**oolbars•**C**ustomize, select command category, click tool button to see description of what it does, drag tool button from Customize window to toolbar
Remove toolbar from screen	**O**ptions•**T**oolbars, select toolbar, **H**ide; or turn toolbar into free-floating window, click upper left corner

FORMATTING

Format numbers in selected cell(s)	Format•**N**umber, select category and code
Change font/style/size of selected cells	Format•**F**ont, select font, style, and/or size
Align or reorient contents of selected cell(s) beyond what can be done at toolbar	Format•**A**lignment, select options
Wrap text within selected cell(s)	Format•**A**lignment•**W**rap Text
Add border to selected cell(s)	Select cell or range, Format•**B**order, select options
Add shading to selected cell(s)	Format•**B**order•**S**hade

CHARTS

Create chart within worksheet, with step-by-step prompts and instructions	Select data to chart, click on ChartWizard tool on Standard toolbar, drag pointer to place chart, answer questions in series of dialog boxes
Create chart within worksheet, without prompts	Display Chart toolbar, select data to chart, click button for desired chart type, drag pointer to place chart
Enter chart object to make changes	Double-click on object
Create chart file	Select data to chart, **F**ile•**N**ew•**C**hart
Change chart type	Click on desired type in Chart toolbar; or **G**allery, select type, select display format
Add titles	**C**hart•Attach **T**ext•Chart **T**itle•OK, type new title, **<Enter>**
Add arrow	Click on arrow in Chart toolbar or **C**hart•Add **A**rrow; move and size arrow as needed
Add legend	Click on legend icon in Chart toolbar or **C**hart•Add **L**egend; move legend where desired
Change text font	Select text object with right mouse button, **F**ont, select options
Change line width or patterns	Select object with right mouse button, **P**atterns, change settings as needed

DATA BASES

A data base within a worksheet should use rows for records and columns for fields. For instance, a mailing list data base would list each person in a separate row, with columns for first name, last name, street address, city, and so on. The first row of a data base contains the field names for the columns.

Define data base	Select range containing field names, data, and blank row below last record, **D**ata•Set Data**b**ase
Use form to edit data base	**D**ata•**F**orm
Sort range on worksheet	Select range (do not include field name row), **D**ata•**S**ort, enter options
Prepare search criteria	Copy field names to another part of worksheet, type search criteria under copied field names, select field names and criteria, **D**ata•Set **C**riteria
Find records that match criteria	Prepare search criteria, **D**ata•**F**ind, use arrow keys to view other matching records
Extract records that match criteria	Prepare search criteria, copy field names to another part of worksheet, select new headings, **D**ata•Set **E**xtract, **D**ata•**E**xtract
Delete records that match criteria	Prepare search criteria, **D**ata•**D**elete

Fold Here

Fold Here

EXTERNAL FILES

An external file is any file other than the one you're currently working on. For you to insert an object from another *Windows* application, the application must work as an OLE server.

Reference value in another worksheet file	=*path\filename*!range name or address; or, with both files open, =, select cell or range in other file, **<Enter>**
Group worksheets so commands affect all of them	Open files, select master worksheet, **O**ptions•**G**roup Edit, hold down **<Ctrl>** while clicking on worksheets
Link data from *Windows* application other than *Excel*	Open non-*Excel* document, select data to be linked, **E**dit•**C**opy, open worksheet, select destination, **E**dit•Paste **L**ink
Replace link with its value	Select cell with formula, **<F2><F9>**
Embed existing non-*Excel Windows* object or document in *Excel* worksheet	Select object or data to be embedded, **E**dit•**C**opy, open *Excel* document, select destination, **E**dit•Paste **S**pecial, select data type, **P**aste
Create embedded non-*Excel Windows* object or document while in *Excel*	Select destination range, **E**dit•Insert **O**bject, select object type; *Windows* will load other application; create object in other application, exit application, confirm all prompts to save file
Export *Excel* file to another application	**F**ile•Save **A**s, type new file name, select file format in Save Files As **T**ype box
Import another application's file into *Excel*	**F**ile•**O**pen, type name of file
Import text file, dividing lines into columns by length	Import file, select column with data, **D**ata•**P**arse, adjust brackets if necessary, change destination if desired
Import text file, dividing lines into columns where fields are separated with specified character	Import file, **F**ile•**O**pen, **C:\EXCEL\LIBRARY\FLATFILE.XLA<Enter>**, select column with data, **D**ata•Smart Parse, select or enter delimiter character

For use with PC World Instant Reference Card Portfolio

Two Ways to Save the Environment

Many programs, including word processors and spreadsheets, allow you to temporarily shell out to DOS. But if you are in one of these temporary DOS sessions when you invoke a batch file—especially one of the more complex ones featured in *Star-Dot-Star*—you may find that the batch fails for lack of environment space.

Here's why. When you shell out of a typical application program, DOS recreates a new environment space, with copies of all the existing environment variables, in whatever unused memory it finds. But since it anticipates a potential memory shortage, DOS makes the new environment space just big enough to hold all the existing variables; it doesn't leave any room for new ones! Thus, when a batch file attempts to create a new environment variable, it gets an 'Out of environment space' error message. The batch continues, but produces incorrect (or even dangerous) results because it can't save information in the environment.

One solution to this problem is to create a "dummy" environment variable for reserving space. For instance, if you add the line SET RESERVE=XX.....XXX (where there are 120 X's on the line) to your AUTOEXEC.BAT file, another batch file can reclaim the room in its own environment with the command SET RESERVE= (where nothing follows the equal sign). The problem with this approach is that everyone who might use the batch file must have the command in his or her AUTOEXEC.BAT if the other batch files are to access the extra room.

Here's another solution: If you know a batch file will require lots of environment space, but you don't know how much will be available, you can design the batch file to temporarily enlarge its own environment. BIGENV.BAT [see **LISTING 3**] provides an example of how you can do this.

The batch file works by calling itself. When launched, BIGENV.BAT checks if its first parameter contains ?Do_It?. If not, BIGENV runs COMMAND.COM with the switches /E:1024, to create a 1K environment, and /C, to run the string that follows as a command. That string runs the batch file again, this time passing it the ?Do_It? parameter.

Because of the passed parameter, BIGENV skips to the Do_It label when it runs inside of itself. A SHIFT command deletes the special argument and shifts the others to the left. The batch can now continue, knowing that it has enough room to work. When the batch is finished, the recursion "unwinds" and the extra COMMAND.COM, with its 1K environment space, is unloaded.

RON LEWIS
HUNTSVILLE, ALABAMA

Editor's note: Each of these approaches is useful under different circum-

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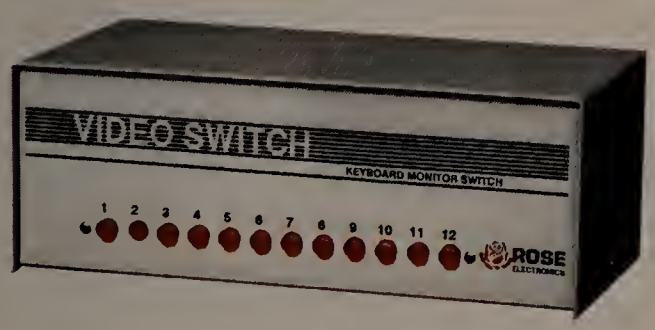

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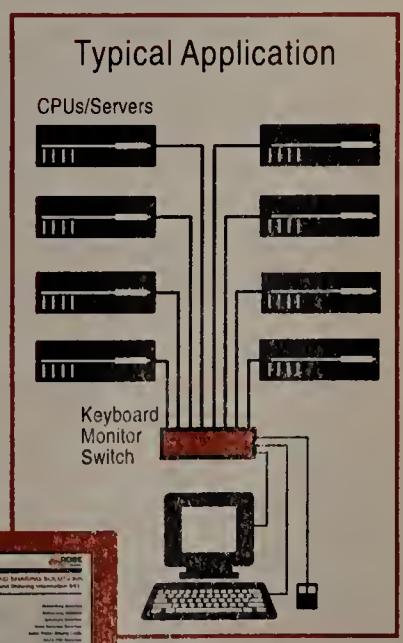

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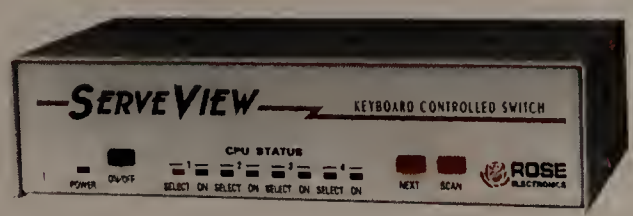

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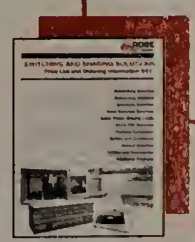

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```
@ECHO OFF
IF "%1" == "?Do_It?" GOTO Do_It
COMMAND.COM /E:1024 /C BIGENV ?Do_It? %1 %2 %3 %4 %5 %6 %7 %8 %9
GOTO Exit

:Do_It
SHIFT
REM  Place regular batch file command here.

:Exit
```

LISTING 3: This sample batch file opens up 1K of environment space, then calls itself to run commands that need the larger environment.

stances. The "reserve" variable is ideal when you need a small amount of space (the most you can reclaim is 123 bytes), and you can edit AUTOEXEC.BAT and your other batch files to use it. Unlike the second technique, this one guarantees that you'll get a specific amount of free environment space, and it doesn't take up extra RAM by reinvoking COMMAND.COM. But if your batch file CALLs another that also uses the same "reserve" variable, the two will compete for the same RAM, and one of them won't work.

The second technique is better when you need more room. It's also easier to set up, because all you need to do is place the appropriate commands at the beginning and end of an existing batch file with heavy environmental needs. However, this method has two drawbacks. First, because it tries to load another copy of the transient portion of COMMAND.COM (which can be as big as 17K), it wastes conventional RAM. Second, the amount of free environment space provided by this technique isn't guaranteed. If your system already has 1009 bytes of environment variables, /E:1024 will provide no more space than you had before. (DOS always rounds the size of the environment up to a multiple of 16 bytes.) For this reason, I recommend this technique primarily for situations in which you can closely estimate the amount of environment space that's already been used.

As you may have noticed, we've printed two tips this month that involve a batch file that calls itself; each of these files uses a similar technique to solve a very different problem. It just goes to show you what a little bit of creativity can do.

Unconditional Save Redux

In the February *Star-Dot-Star* column, James Knoblock showed how a *1-2-3* file-saving macro could work dependably whether there was already a file with the same name or not. (*1-2-3* prompts for confirmation when you save to an old file name but not when you save to a new one—a situation that can confuse a macro.) I have a simpler solution. Following the Save command with an *R* and an *<Esc>* will instruct *1-2-3* to overwrite the old file if it asks and will have no effect if it doesn't. Thus, a one-line macro, **/FS***filename*~**R{ESC}**, will handle all situations.

NATHAN X. SNEED
BETHESDA, MARYLAND

Have a macro, batch file, short program, or general tip you're proud of? Mail your tips to Star-Dot-Star, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Star-Dot-Star; CompuServe, 74055,412; MCI Mail, PC World Editorial; Internet, rogue@well.sf.ca.us; or 415/442-1891 (fax).* PC World *pays $25 to $200 for each tip used. Sorry, we cannot acknowledge unpublished materials.*

Brett Glass is a contributing editor for PC World.

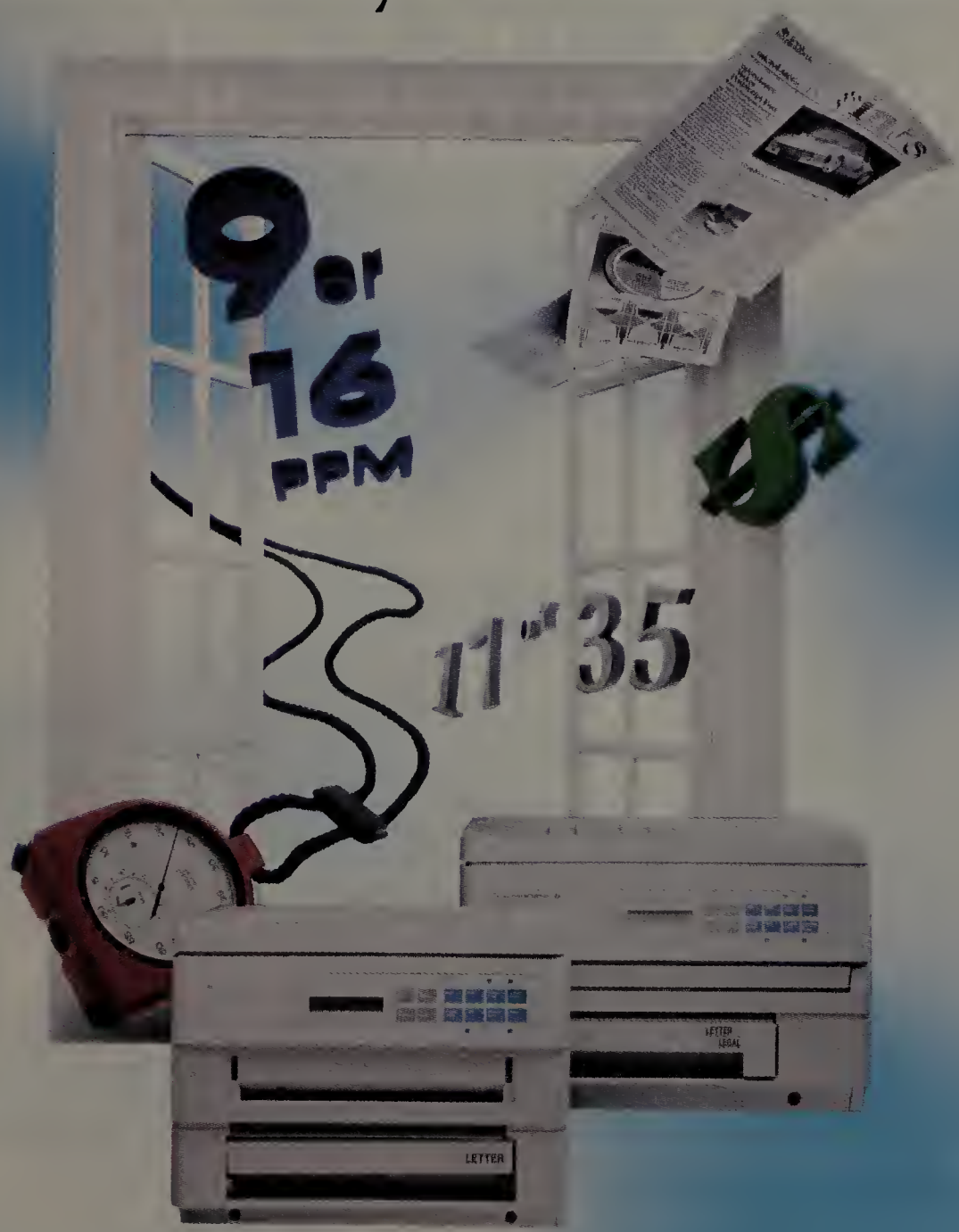
POWER TIP NO. 256

True Flush-Right Alignment in 1-2-3

When you use the quote (") label prefix to right-align your cell contents, a single space is always retained at the right border. So for true right alignment, you must left-align the label with the apostrophe (') prefix and insert the correct number of leading spaces. This macro counts the spaces you need, no matter what the cell width. You can run it again if you increase cell width, but if you reduce, you must delete the existing leading spaces before rerunning the macro. For example, to set up the macro in cells G1..G3, place your cursor in cell G1, type **{edit}{home}{del}**, and press **<Down>**. Then type '**@repeat(" ",@cellpointer("width")-@length(@cellpointer("contents")))&"** and press **<Down>**. Finally, type **{end}"{calc}**~ in cell G3, press **/RNC**, and enter \ followed by the letter you want to use to invoke the macro. Highlight the range G1..G3 and press **<Enter>**. Then place your cursor on a cell holding a label you want right-aligned, hold down **<Alt>**, and press your macro call letter.

Shane Devenshire
Walnut Creek, California

Four reasons to buy a TI microLaser™ printer.



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Tape Drives	295	
SOFTWARE		
Accounting		300
Business Applications	295	300
Business Productivity		301
CD Rom	296	
Church Applications		301
Communications	295	
Cooking	295	
Data Entry		301
Educational		301-302
Electronic Forms		301
Entertainment/Games		301
Financial		301
Flow Charting		303
Fortran		303
Genealogy		303
General		303
Graphics	296	303
Health		303
Inventory Control/Management		303

Product Category	Business Class	Computer Showplace
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Maintenance Management		303
Manufacturing		303
Medical		304
Music		304
Networking		304
On Line Services		304
Point of Sale		304
Public Domain/Shareware		304
Real Estate		304-305
Reference	296	
Sales & Marketing		305
Security		305
Schools		305
Statistics		305
Surveys		305
Time Management		305
Utilities		305
MISCELLANEOUS		
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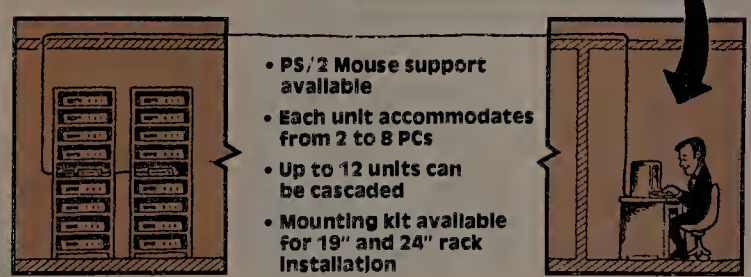

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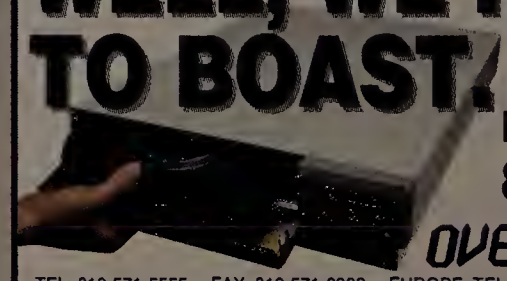

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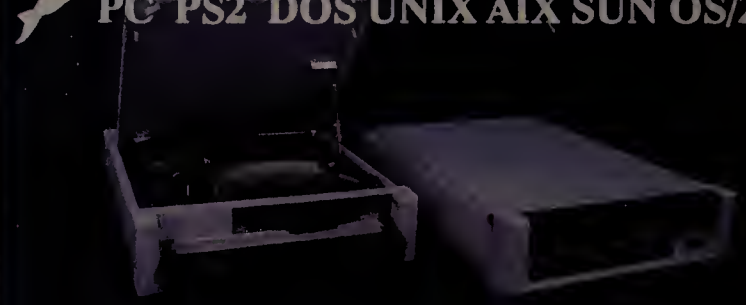

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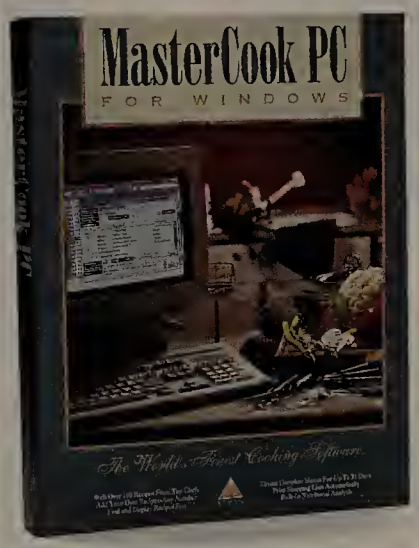

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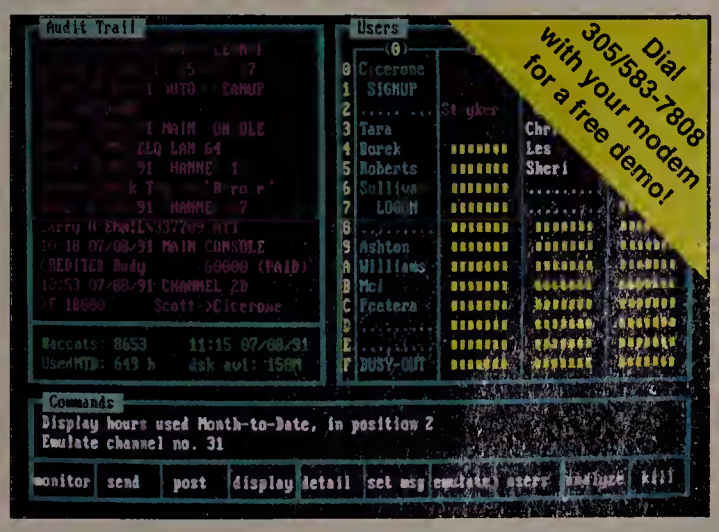

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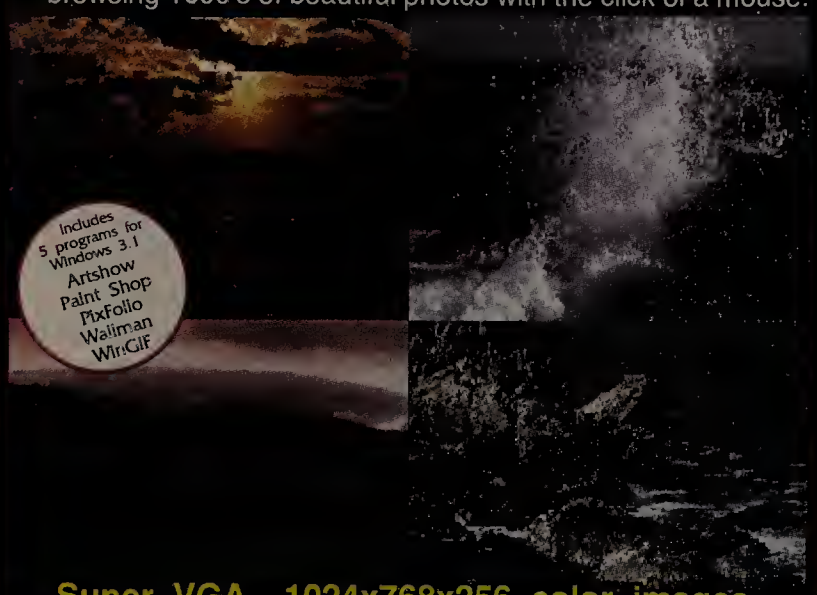

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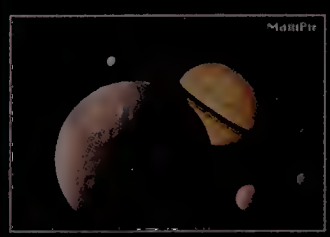

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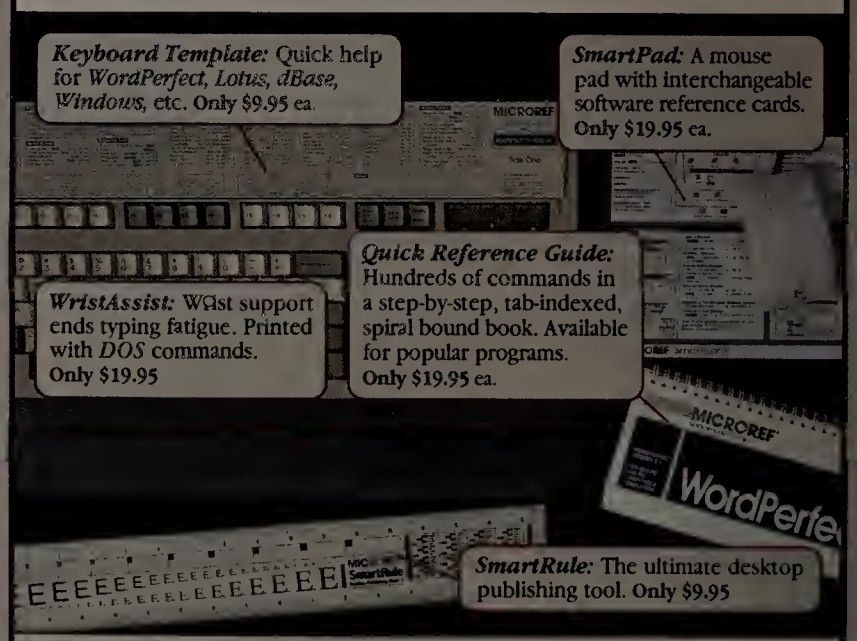

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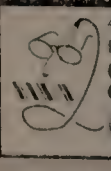

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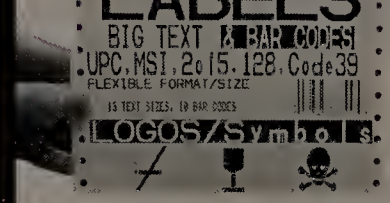

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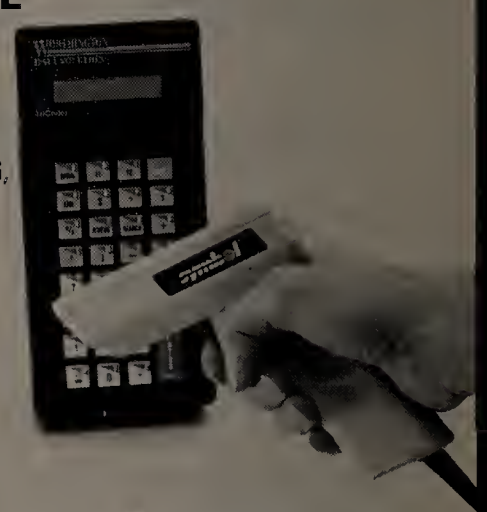

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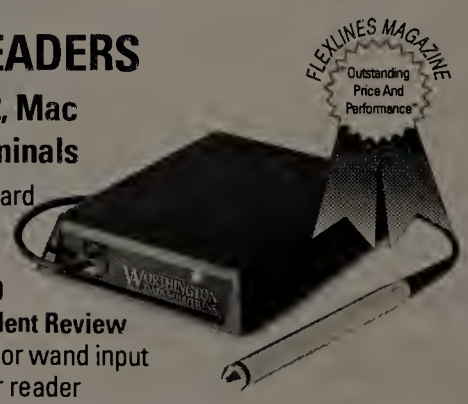

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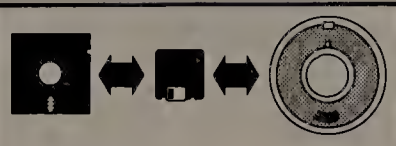

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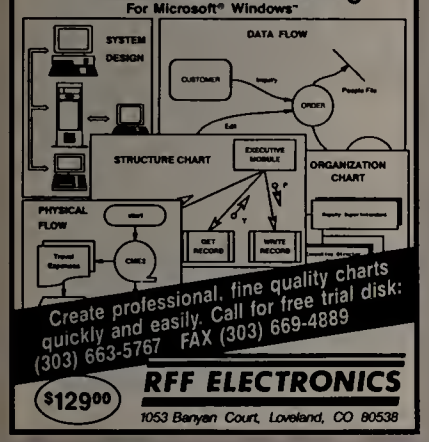

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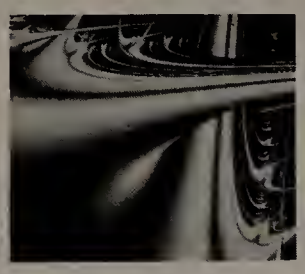

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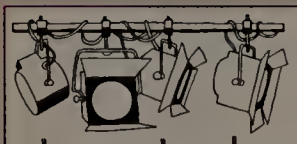

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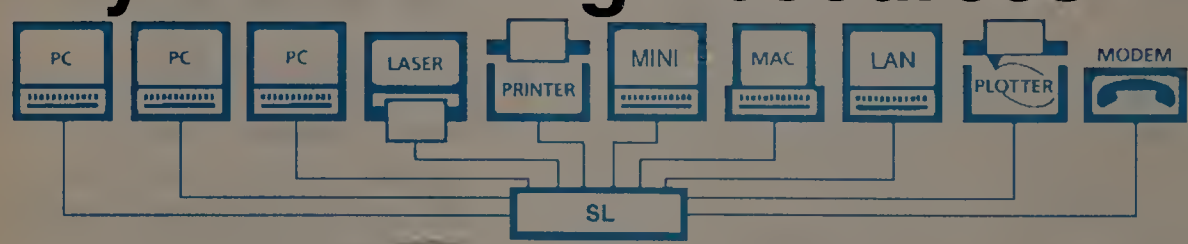

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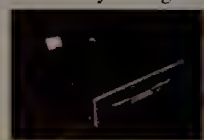

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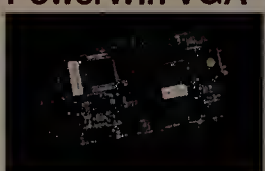

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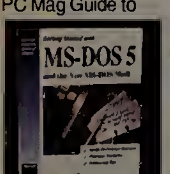

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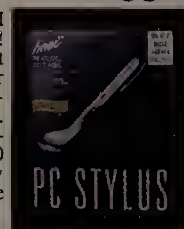

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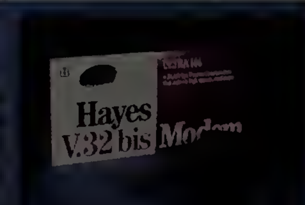

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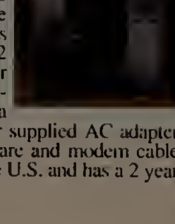

Ideal for portable and notebook computers, the Traveller Pocket FaxModem includes 9600/4800 bps send/receive fax and 2400bps modem with V.42 bis & MNP 2-5 for 9600bps throughput. It's runs on a nine-volt battery or supplied AC adapter and includes software and modem cable too! It's built in the U.S. and has a 2 year warranty.

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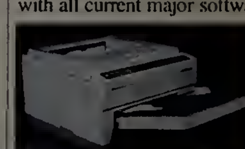

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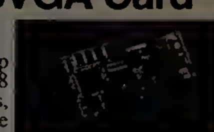

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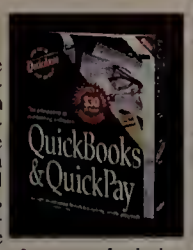

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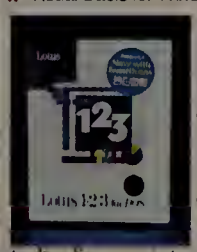

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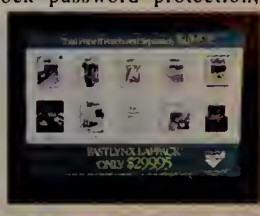

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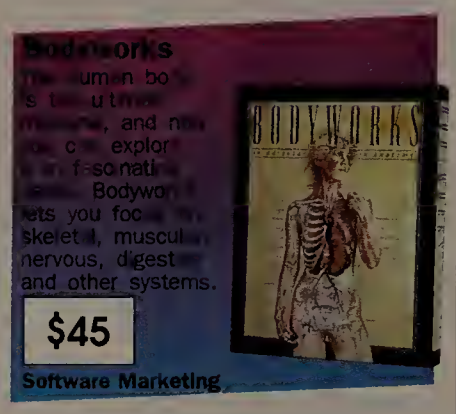

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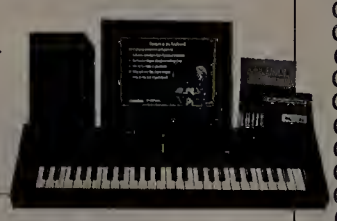

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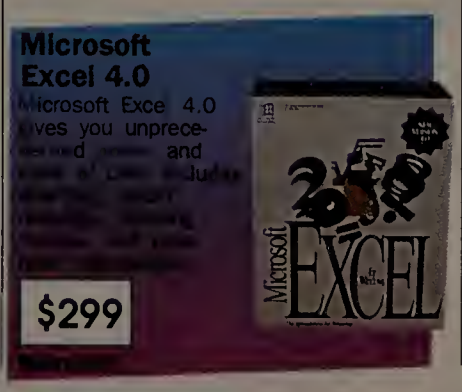

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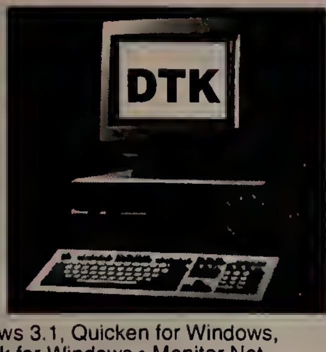

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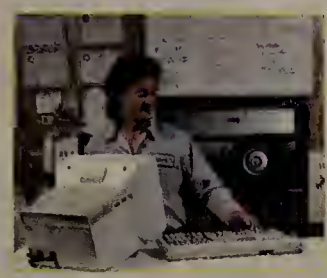

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THE HOME OFFICE

BY STEVE BASS

The practical guide to home/office computing

Let's get to the point: GUIs or no, there are still plenty of times when you have to work from the DOS prompt. And it's so annoying to struggle through the retyping of lengthy subdirectory paths or misspelled DOS commands.

There are commercial and shareware programs to minimize your keystrokes, but you may have overlooked a spectacular utility already on your PC. When you installed DOS 5.0, you also got DOSKEY, a first-rate keyboard enhancer.

DOSKEY saves time three ways. First, instead of retyping commands, I replay them. It's also easier to turn a recycled command into a new one than to retype all those letters just to change a few. But the neatest part is, I can create a macro that executes a whole series of commands by typing a single letter or number (but no <Ctrl>- or <Alt>-*key* combinations).

Load DOSKEY into your AUTOEXEC.BAT, and it will always be handy. A tiny TSR, it takes almost no conventional memory if you load it high using a memory manager. The line in my AUTOEXEC.BAT reads 'LOADHIGH DOSKEY /BUFSIZE=3000'. The default buffer size is 1024 bytes, but I increased it to 3K to allow for plenty of macros and a larger command history.

DOSKEY's slickest trick is that it lets you cycle through your previous commands using the up and down cursor keys. <Page Up> gets you to the first command, <Page Down> to the last. <F7> displays all the commands in your history along with their line numbers. <F9> followed by the line number displays a command for editing. Even handier is the <F8> search key: Type in the first few letters of a command, and up comes the closest match.

But to tap into DOSKEY's real power, you have to experiment with macros. You probably already use batch files for repeated multiple operations. Macros are similar but take practically no disk space—they all reside in one definition file. Macros are easier to create than batch files, run faster, and take priority over similarly named batch files and DOS commands.

JOHN PIRMAN

My rule is, if I use the same DOS keystrokes more than once a day, I convert them into a DOSKEY macro. It's easy—just type **DOSKEY** followed by the macro name, an equal sign, and the definition. For example, **DOSKEY EXE=DIR *.EXE** creates the macro EXE, which when run gives me a directory of files ending in EXE. If a macro has the same name as a DOS command or batch file, DOS runs the macro; type a space first to run the DOS command or batch file instead.

DOSKEY macros have a few variations on the replacement parameters used in batch files. For example, the macro equivalents to the replaceable batch parameters %1 through %9 are $1 through $9. You can include multiple DOS commands in a macro, but they must be separated with $T.

Ever delete all the files in your hard disk's root directory when you're just trying to clean a floppy? I don't anymore. Just enter the command **DOSKEY ZAP=DEL A:*.***, and thereafter you can simply enter **ZAP** to delete only the files on your A: drive no matter which drive you're logged on to. To create a new subdirectory named WORK and copy all the files on the A: drive into it, try a macro called SLICK: Type **DOSKEY SLICK=MD $1 $T COPY A:*.* $1**. Then type **SLICK WORK**, press **<Enter>**, and go get a cup of coffee.

If you don't want to lose today's macros when you turn off your machine, save them to a file: Type **DOSKEY /MACROS>MACS.BAT**. You'll also need to edit the batch file, placing **DOSKEY** and a space at the start of each line. Then add **CALL MACS.BAT** to your AUTOEXEC.BAT after the line that loads DOSKEY.

Sure, it's only a few keystrokes here and there, but DOSKEY makes your day go a lot smoother.

Contributing Editor Steve Bass is a family therapist and president of Pasadena IBM Users Group. He can be reached on PC World Online (see page 8 for more information).

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So, it's simple. We've made a lot of computers. And those computers, well, they've made a lot of noise in the customer satisfaction polls. In fact, we beat IBM and Compaq in every *PC Week* Customer Satisfaction poll we've ever competed in. We also managed to win 53 product awards in 1991 alone.

Why?

Maybe it's because of our toll-free technical support. Maybe it's because we usually cost 10-20% less than our larger competitors. Maybe it's because that price includes service which can get a trained technician to your home or office usually the next business day.△ Or maybe, just maybe, we make a better computer.

That could be why over two-thirds of the companies in the FORTUNE 500 now buy from Dell. So, you see, we were part of the FORTUNE 500 even before we were part of the FORTUNE 500. We'd like to be a part of your company too.

Why not give us a call?

*6AM - midnight toll-free phone support available beginning 8/1/92. ◊ Leasing arranged by Leasing Group, Inc. Outside the U.S., prices and configurations may vary. i386 and the Intel Inside Logo are trademarks of Intel Corporation. FORTUNE 500 is a registered trademark of The Time Inc. Magazine Company. Microsoft and MS-DOS are registered trademarks and Windows and BallPoint are trademarks of Microsoft Corporation. △ Service provided by BancTec Service Corp. On-site service may not be available in certain remote locations. Dell disclaims proprietary interest in the marks and names of others. ©1992 Dell Computer Corporation. All rights reserved.

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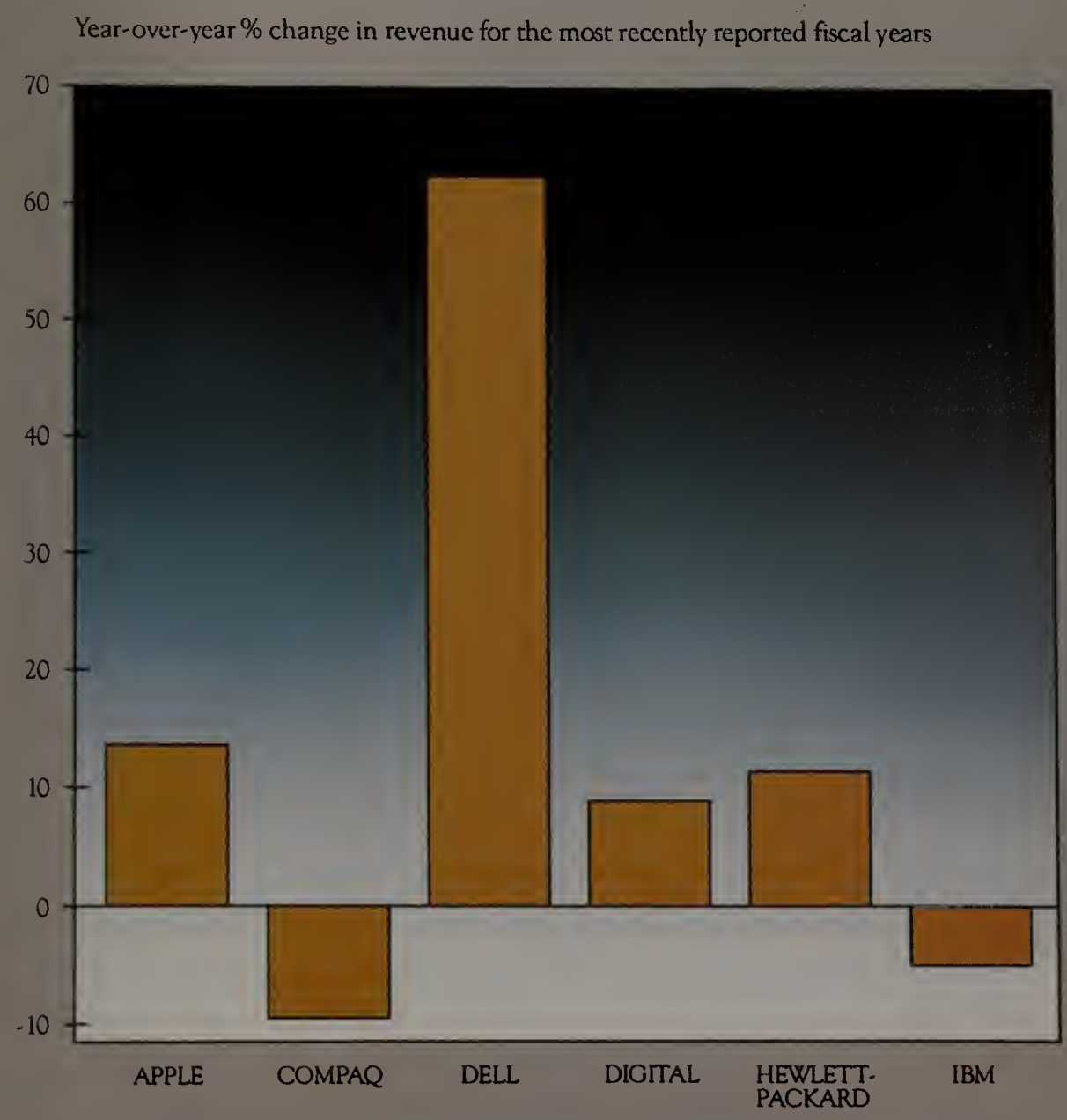

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HOURS: 7AM-9PM CT MON-FRI, 8AM-4PM CT SAT, 10AM-3PM CT SUN

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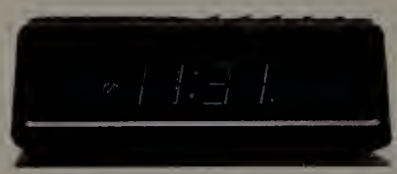
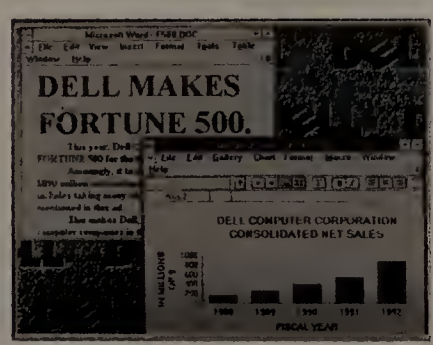
THE BEST COMPUTER IN AMERICA, POUND FOR POUND FOR POUND AND A HALF.

At just over 3.5 lbs, the Dell® 320SLi offers features and functions usually reserved for systems twice its weight. So call and order one today. At this price, it shouldn't be a heavy decision.



You're not the only one working late. Dell's toll-free support lines are now open 6 AM to midnight every day. There's also nationwide on-site service and a 24-hour TechFax™ line. △*



Comes standard with everything you need to run even the most hardcore software: MS-DOS® 5.0, Microsoft® Windows™ 3.1 and a keyboard mouse.

intel inside

That's not all you'll find in here. There's room for a modem, coprocessor, 120 MB hard drive and up to 10 MB of RAM.

Your hands don't get smaller just because your computer does. So Dell gave the 320SLi a full 85-key keyboard, including special screen navigation keys in the familiar inverted-T layout.

We call it a notebook, but it's actually smaller. Just 7¾" x 11" and only 1¼" thick. So you might actually be able to fit some briefs in your briefcase. Maybe even a sandwich or two.

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This small number gets you all these big numbers: 20 MHz i386™ SL processor, 2 MB of RAM, 60 MB hard drive, VGA Reflective (9.5", 640 x 480) LCD, external 3.5" floppy drive and up to 4 hours of work from the NiMH battery.

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